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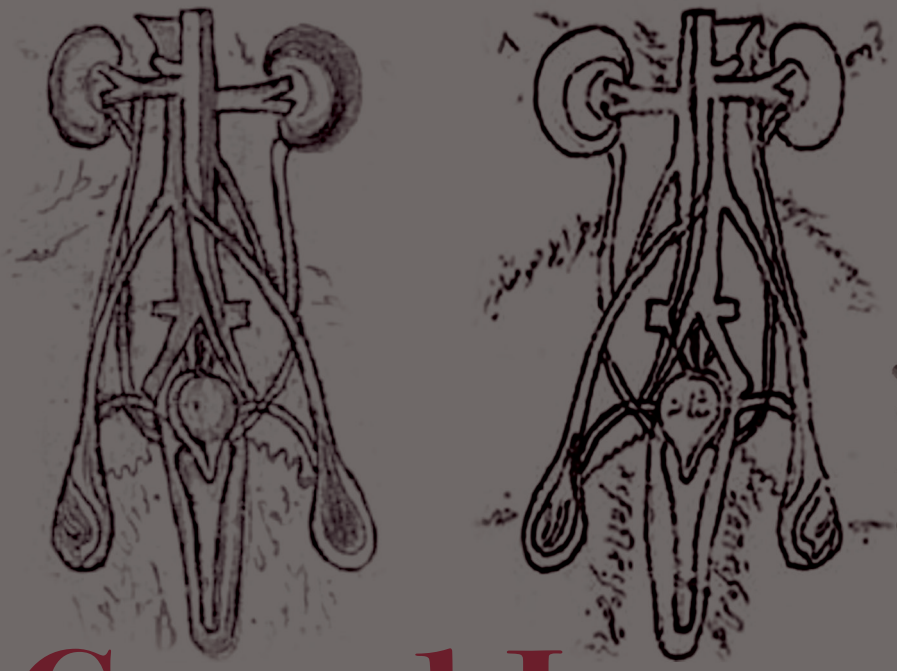

Grand Journal of UROLOGY

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Grand Journal of UROLOGY

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Acknowledgments (If Available)

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[1], [3-5], [6,9], [8-12,16].

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[1] Guner E, Seker KG, Arikan Y, Huseynov C, Sam E, Ozdal OL. Aktuelle Urol. 2020; 51: 285-289. https://doi.org/10.1055/a-1117-2776.

- Article with more than six authors

[2] Karabulut D, Karabulut U, Caglar FN, Ekşi M, Yenice MG, Guner E, et al. The association between CHA2DS2-VASc score and erectile dysfunction: a cross-sectional study. Int Braz J Urol. 2019; 45: 1204-1208. https://doi.org/10.1590 / S1677-5538. IBJU.2019.0058.

- Book

[3] Sweetman SC. Martindale the Complete Drug Reference. 34th ed. London: Pharmaceutical Press; 2005.

- Book chapter

[4] McKenna K. Ejaculation. In: Knobil E, Neil J, editors. Encyclopedia of Reproduction, New York: Academic Press; 1999, p. 1002-8.

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After receipt of the article through the electronic submission system, it will be considered by Assistant Editor. The texts will be checked in terms of accordance with Journal's Instructions for Authors format and plagiarism by using iThenticate similarity Check system for identifying. After the first check, the Assistant Editor will forward the relevant articles to the Editor-in-Chief. The Editor-in-Chief will check the article in terms of Journal's scope, style and format, originality, and scientific quality. Each manuscript will be sent to

at least two external, independent reviewers who are experts in their fields by the Editor-in-Chief/Associate Editors to guarantee a double-blind evaluation process. Evaluating the articles in a short period of 4-6 weeks by the reviewers and sending feedback to the authors is a policy considered by the journal for the fast publication process.

We are applying the same steps to the double-blind peer-review process when we got the in-house submission.

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Editorial

Dear colleagues,

I am honored to share with you the second issue of 2025 (volume 6, issue 2) of the Grand Journal of Urology (Grand J Urol) with the contributions of many respected researchers and authors.

Grand Journal of Urology (GJU) aims to carry written and visualscientific urology studies to academic platforms and to make significant contributions to the science of urology. Our journal has been abstracted/indexed in Tubitak Ulakbim TR Index, EBSCOhost, J-Gate, SciLit, ResearchGate and Google Scholar international databases. As of these achievements, the Grand Journal of Urology (GJU) has taken its place among the journals indexed by national and international databases.

In this issue of our journal, there are many valuable articles under the subheadings of Andrology, Endourology, General Urology, Reconstructive Urology, Urolithiasis and Urologic Oncology. I hope that these carefully prepared articles will make important contributions to valuable readers, researchers and the urology literature.

On this occasion, I would like to express my heartfelt gratitude to our authors who have contributed to our journal with their articles, to our reviewers who have meticulously evaluate the articles.

Respectfully yours

May 2026

Assoc. Prof. Ekrem GUNER, MD

Editor-in-Chief

Original Article - Andrology
Grand J Urol 2026;6(2):53-9
DOI: 10.5505/GJU.2026.47550

How Do Urologists Approach Hematospermia? A Cross-Sectional Study Among Specialists and Residents

Ürologlar Hematospermiye Nasıl Yaklaşır? Uzmanlar ve Asistanlar Arasında Yapılan Kesitsel Bir Çalışma

Rıdvan Kayar[1], Kemal Kayar[1], İlker Artuk[1], Samet Demir[1], Recep Çıkrıkcı[1],Emre Tokuç[2], Metin İshak Öztürk[1]

[1]Department of Urology, University of Health Sciences, Haydarpasa Numune Training and Research Hospital, İstanbul, Türkiye
[2]Department of Urology, Bahcesehir University, Medical Park Goztepe Hospital Complex, İstanbul, Türkiye

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Corresponding Author: Rıdvan Kayar / University of Health Sciences, Haydarpasa Numune Training and Research Hospital, Department of Urology, İstanbul, Türkiye
dr.ridvankayar@gmail.com / ORCID ID: 0000-0002-1765-919X

Abstract

Objective: To investigate the diagnostic, therapeutic, and clinical attitudes of urology residents and specialists in Türkiye toward hematospermia (HS).
Materials and Methods: A cross-sectional electronic survey was conducted between July 17 and August 17, 2025, among urology specialist and residents actively practicing in Türkiye. The questionnaire assessed participants' demographic characteristics, frequency of HS cases, diagnostic and treatment preferences, and perceptions regarding the condition's psychosocial impact. Descriptive statistics were used, and group comparisons were performed using Pearson's chi-square or Fisher's exact test.
Results: A total of 101 urologists (56 specialists and 45 residents) participated. While 57.4% had managed over 10 HS cases, 68.3% reported most patients were between 30–50 years old. Physical examination was routinely performed by over half of both groups. Residents were more likely than specialists to order urine cultures (86.7% vs. 57.1%, p=0.003). Recurrent HS and urinary symptoms were common triggers for further diagnostic evaluation. Quinolones were the most preferred antibiotics, significantly more so among specialists (81.8% vs. 40.0%, p<0.001). Specialists had higher experience with surgical/interventional procedures (p=0.001). Most participants considered patient age, symptoms, and clinical context in their overall approach. Approximately 60% of urologists believed HS negatively impacted patients sexual lives.
Conclusion: Despite general agreement on a symptom-guided approach, notable differences exist between urology residents and specialists regarding diagnostic tests, antibiotic use, and procedural interventions for HS. The findings highlight the need for standardized management guidelines and improved educational strategies.

Keywords: hematospermia, cross-sectional studies, residency, specialists

Özet

Amaç: Türkiye'deki üroloji asistanları ve uzmanlarının hematospermiye (HS) yönelik tanı, tedavi ve klinik yaklaşımlarını araştırmak.
Gereçler ve Yöntemler: 17 Temmuz ile 17 Ağustos 2025 tarihleri arasında, Türkiye'de aktif olarak çalışan sertifikalı ürologlar ve asistanlar arasında kesitsel bir elektronik anket gerçekleştirildi. Anket, katılımcıların demografik özelliklerini, HS vakalarının sıklığını, tanı ve tedavi tercihlerini ve bu durumun psikososyal etkisine ilişkin algılarını değerlendirdi. Tanımlayıcı istatistikler kullanıldı ve grup karşılaştırmaları Pearson ki-kare testi veya Fisher'ın kesin testi kullanılarak yapıldı.
Bulgular: Toplam 101 ürolog (56 uzman ve 45 asistan) katıldı. Katılımcıların %57,4'ü 10'dan fazla HS vakası yönetmişken, %68,3'ü çoğu hastanın 30-50 yaşları arasında olduğunu bildirmiştir. Her iki grubun da yarısından fazlası rutin olarak fizik muayene yapmıştır. Asistanlar, uzmanlara göre idrar kültürü isteme eğiliminde daha fazladır (%86,7'ye karşı %57,1, p=0,003). Tekrarlayan HS ve üriner semptomlar, ileri tanı değerlendirmesi için yaygın tetikleyicilerdi. Kinolonlar en çok tercih edilen antibiyotiklerdi ve uzmanlar arasında bu oran önemli ölçüde daha yüksekti (%81,8'e karşı %40,0, p<0,001). Uzmanlar cerrahi/girişimsel prosedürler konusunda daha fazla deneyime sahipti (p=0,001). Katılımcıların çoğu, genel yaklaşımlarında hastanın yaşını, semptomlarını ve klinik bağlamı dikkate aldı. Ürologların yaklaşık %60'ı HS hastaların cinsel yaşamlarını olumsuz etkilediğine inanıyordu.
Sonuç: Semptom odaklı yaklaşım konusunda genel bir fikir birliği olmasına rağmen, HS için tanı testleri, antibiyotik kullanımı ve prosedürel müdahaleler konusunda üroloji asistanları ve uzmanları arasında önemli farklılıklar bulunmaktadır. Bulgular, standartlaştırılmış tedavi kılavuzlarına ve iyileştirilmiş eğitim stratejilerine duyulan ihtiyacı vurgulamaktadır.

Anahtar kelimeler: hematospermi, kesitsel çalışmalar, asistanlık, uzmanlar

ORCID ID:	K. Kayar	0000-0003-0731-9877	S. Demir	0009-0006-5333-134X	E. Tokuç	0000-0002-5885-9278
	İ. Artuk	0000-0002-7889-4943	R. Çıkrıkcı	0009-0005-7457-7974	M.İ. Öztürk	0000-0002-1868-2316

Introduction

Hematospermia (HS), characterized by the presence of blood in semen, is a relatively rare clinical finding that often causes significant concern for patients despite its typically benign nature. While a specific etiology is frequently not identified, underlying infectious, inflammatory, or—less commonly—malignant conditions may occasionally be responsible [1]. Although HS is often a self-limiting condition, further evaluation may be warranted based on factors such as the patient's age, recurrence of symptoms, and the presence of accompanying findings. Diagnostic assessments may include urinalysis, urine or semen cultures, digital rectal examination, prostate-specific antigen (PSA) testing, transrectal ultrasonography, and pelvic magnetic resonance imaging in selected cases [2]. The 2025 guidelines of the European Association of Urology (EAU) on Male Sexual and Reproductive Health propose a structured diagnostic pathway for HS, recommending further evaluation particularly in men over 40 years of age, in cases of recurrent episodes, or when accompanied by additional urological symptoms [3].

Nevertheless, despite the presence of evidence-based guidelines, diagnostic and therapeutic approaches to HS remain highly variable in routine clinical settings. In Türkiye, factors such as differences in clinical experience, institutional protocols, and educational backgrounds may contribute to this variability among urologists. However, there is a lack of data on how HS is actually evaluated and managed in everyday urological practice across the country. This study aimed to assess the diagnostic and treatment approaches toward HS among practicing urologists and residents in Türkiye through a pilot cross-sectional survey involving participants from diverse institutions.

Materials and Methods

Study Design and Participants

This study was designed as a cross-sectional survey conducted between July 17, 2025, and August 17, 2025. The target population consisted of urology specialists and residents actively practicing in Türkiye. Inclusion criteria were: (1) being urology specialist or resident in training within Türkiye, (2) providing informed consent at the beginning of the survey, and (3) completing the questionnaire fully and consistently. Participants who did not provide consent, were not affiliated with urology, or submitted incomplete or inconsistent responses were excluded.

Data Collection

Data were collected via an anonymous, self-administered electronic questionnaire distributed during national, regional, and local urology congresses, symposiums, and scientific meetings. At each event, the researchers presented a brief explanation of the study's purpose and invited voluntary participation. Participants completed the survey electronically using a secure, anonymous link. No personally identifiable or contact information was collected.

Survey Content

The questionnaire included items assessing participants' demographic characteristics (e.g., academic title, years of experience, institutional setting), the number of HS cases they had encountered, their diagnostic and therapeutic approaches, and their perceptions of HS's psychosocial impact. The survey was designed specifically for this study and underwent internal validation by the research team prior to distribution.

Ethical Considerations

Participation was entirely voluntary and anonymous. All participants were informed that they could withdraw at any time without penalty. The study protocol was reviewed and approved by the institutional ethics committee of Haydarpaşa Numune Training and Research Hospital (HNEAH-GOAEK/KK/2025/79), in accordance with the Declaration of Helsinki and Good Clinical Practice (GCP) guidelines.

Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the data. Categorical variables were presented as frequencies and percentages. Comparisons between urology residents and specialists were performed using Pearson's chi-square test. When the expected frequency in any cell was less than 5, Fisher's exact test was applied. A p-value of <0.05 was considered statistically significant. For multiple-response questions, each answer option was treated as a separate binary variable (selected vs. not selected), and comparisons between groups were performed using Pearson's chi-square or Fisher's exact test accordingly. Individual p-values for each response item are reported in the corresponding tables.

Results

A total of 101 urologists participated in the study, including 56 specialists (55.4%) and 45 residents (44.6%). Among the residents, the largest proportion were in their third year of training (n=20, 19.8%), followed by fourth-year or higher (n=13, 12.9%), second year (n=7, 6.9%), and first-year (n=5, 5.0%) trainees. Regarding clinical experience, 12 participants (11.9%) had less than 2 years of practice, 36 (35.6%) had 3–5 years, 18 (17.8%) had 6–10 years, and 35 (34.7%) had over 10 years of professional experience. The majority of respondents were affiliated with training and research hospitals (59.4%), followed by university hospitals (24.8%), state hospitals (8.9%), and private institutions (6.9%) (**Table 1**).

In terms of HS case exposure, 57.4% of participants reported having seen more than 10 patients with HS, whereas 27.7% had seen between 1–5 cases and 12.9% had encountered 6–10 cases. Only 2 participants (2.0%) reported no prior experience with HS cases. When asked about the age group most commonly affected, 68.3% of urologists indicated that the majority of their HS patients were aged between 30–50 years. Younger patients (<30 years) and those older than 50 years were reported less frequently (13.9% and 15.8%, respectively). Among 22 participants who had diagnosed malignancy in HS cases, prostate cancer was the most commonly identified (77.3%), followed by bladder cancer (13.6%) and testicular cancer (9.1%) (**Table 1**).

When evaluating patients presenting with HS, most respondents—both residents (55.6%) and specialists (51.8%)—reported routinely performing a physical examination that includes the testes, prostate, and perineum. A substantial proportion, how-

ever, indicated that they perform such examinations only in the presence of symptoms (residents: 37.8%, specialists: 37.5%). There was no statistically significant difference between groups (p=0.870). In terms of initial diagnostic testing, urinalysis was the most commonly ordered investigation by both residents (93.3%) and specialists (83.9%). Notably, residents were significantly more likely to request a urine culture (86.7% vs. 57.1%, p=0.003). Ejaculate culture was requested by approximately one-third of both groups, while condom testing was rarely used. Interestingly, 8.9% of specialists reported not ordering any tests during the initial episode, whereas none of the residents did so. Regarding indications for further diagnostic evaluation, recurrent HS was universally cited by residents (100%) and commonly by specialists (69.4%) as a trigger. Other frequently reported factors included accompanying urinary symptoms or hematuria (residents: 73.3%, specialists: 85.7%), abnormal digital rectal examination findings (77.8% vs. 69.6%), and a family history of prostate cancer (82.2% vs. 76.8%). Age over 40 was more often considered an indication by specialists (69.6%) than residents (46.7%), though the difference was not statistically significant (p=0.055) (**Table 2**).

The majority of both groups preferred a selective approach to PSA testing, with 73.3% of residents and 75.0% of specialists indicating they would order PSA only in patients older than 40 years with recurrent HS. Routine PSA testing was less common (residents: 20.0%, specialists: 21.4%), and a small number of participants reported never ordering PSA (6.7% and 3.6%, respectively; p=0.815). In terms of imaging, recurrent HS (residents: 86.7%, specialists: 76.8%) and accompanying hematuria (77.8% vs. 80.4%) were the most common indications. Age over 40 and palpable testicular mass were also frequently reported as triggers. Notably, specialists were more likely than residents to perform imaging in all patients regardless of findings (26.8% vs. 6.7%; p=0.122). The most frequently preferred imaging modality was urinary system ultrasonography (residents: 66.7%, specialists: 69.6%), followed by scrotal ultrasonography (35.6% vs. 46.4%) and pelvic magnetic resonance imaging (35.6% vs. 39.3%). Transrectal ultrasound was less frequently used, and no participants reported using computed tomography as their primary imaging method (p=0.638) (**Table 2**).

Regarding the initiation of antibiotic therapy in HS, most respondents reported that the presence of infectious findings was the primary determinant, particularly among residents (66.7%) compared to specialists (46.4%). Although not statistically significant (p=0.071), specialists were more likely to initiate antibiotics for all patients at the first visit (12.5% vs. 4.4%) or to refrain from prescribing antibiotics altogether (7.1% vs. 0%). There was a statistically significant difference in the choice of antibiotic group between the two groups (p<0.001). Quinolones were the most preferred antibiotics among both groups but were markedly more common among specialists (81.8%) than residents (40.0%). Residents were more likely to prefer alternatives such as trimethoprim-sulfamethoxazole (28.9% vs. 12.7%) and tetracyclines (22.2% vs. 5.5%). Broad-spectrum beta-lactams were selected by a small proportion of residents (8.9%) and none of the specialists (**Table 3**).

When asked about prior experience with interventional procedures for HS, specialists reported significantly higher rates of surgical or diagnostic interventions (p=0.001). These included transrectal aspiration of prostatic cysts (23.2% vs. 8.9%), cystourethroscopy with fulguration of prostatic varices (23.2% vs. 4.4%), and transurethral incision of utricular cysts (23.2% vs. 11.1%). While most residents (82.2%) had not performed any procedure for HS, this proportion was notably lower among specialists (57.1%). Finally, 25.0% of specialists and 17.8% of residents reported having diagnosed malignancy in patients followed for HS, though the difference did not reach statistical significance (p=0.382) (**Table 3**).

When asked about their overall clinical approach to HS, the majority of both residents (68.9%) and specialists (69.6%) reported that their management strategies vary depending on patient-related factors such as age, accompanying symptoms, and overall clinical context. A smaller proportion of participants stated that they primarily exclude infectious causes and recommend follow-up (residents: 20.0%, specialists: 17.9%). A more cautious approach was adopted by 12.5% of specialists and

Table 1. Demographic characteristics, clinical experience, and hematospermia-related case exposure of surveyed urologists

Title	(n: 101, %)
	Specialist: 56 (55.4%)
	Resident: 45 (44.6%)
Residency year (among residents only, n: 45)	1st Year: 5 (5.0%)
	2nd Year: 7 (6.9%)
	3rd Year: 20 (19.8%)
	4th Year and above: 13 (12.9%)
Clinical experience duration	0–2 years:12 (11.9%)
	3–5 years: 36 (35.6%)
	6–10 years: 18 (17.8%)
	>10 years: 35 (34.7%)
Institution	Training and research hospital: 60 (59.4%)
	University hospital: 25 (24.8%)
	State hospital: 9 (8.9%)
	Private hospital/clinic: 7 (6.9%)
Number of hematospermia cases encountered	0: 2 (2.0%)
	1-5: 28 (27.7%)
	6-10: 13 (12.9%)
	>10: 58 (57.4%)
Age group of hematospermia patients	>50 years: 16 (15.8%)
	30-50 years: 69 (68.3%)
	<30 years: 14 (13.9%)
Diagnosed malignancies among HS patients	(n: 22, %)
	Prostate cancer: 17 (77.3%)
	Bladder cancer: 3 (13.6%)
	Testis cancer: 2 (9.1%)

Table 2. Diagnostic approaches of urology residents and specialists in the evaluation of hematospermia

	Resident (n:45)	Specialist (n:56)	P
Q6. Do you routinely perform a physical examination (testes, prostate, perineum, etc.) during the initial evaluation of patients presenting with hematospermia?			0.870[1]
A1. Yes, always	25 (55.6%)	29 (51.8%)	
A2. Only if the patient is symptomatic	17 (37.8%)	21 (37.5%)	
A3. No	3 (6.7%)	6 (10.7%)	
Q7. Which tests do you typically request during the first episode of hematospermia?			**0.003[2]**
A1. Urine analysis	42 (93.3%)	47 (83.9%)	
A2. Urine culture	39 (86.7%)	32 (57.1%)	
A3. Ejaculate culture	14 (31.1%)	20 (35.7%)	
A4. Condom test	1(2.2%)	0 (0%)	
A5. I do not request any tests	0 (0%)	5 (8.9%)	
Q8. Which of the following factors would prompt you to request advanced diagnostic evaluation in a patient with hematospermia?			0.055[2]
A1. Age >40	21 (46.7%)	39 (69.6%)	
A2. Recurrent hematospermia	45 (100%)	54 (69.4%)	
A3. Accompanying urinary symptoms or hematuria	33 (73.3%)	48 (85.7%)	
A4. Abnormal digital rectal examination findings	35(77.8%)	39 (69.6%)	
A5. Family history of prostate cancer	37 (82.2%)	43 (76.8%)	
A6. I never request advanced diagnostic evaluation	0 (0%)	0 (0%)	
Q9. Do you request PSA testing in patients with hematospermia?			0.815[1]
A1. Yes, always	9 (20.0%)	12 (21.4%)	
A2. Only if the patient is over 40 and has recurrent hematospermia	33 (73.3%)	42 (75.0%)	
A3. I do not request PSA	3 (6.7%)	2 (3.6%)	
Q10. Under which conditions do you request imaging for patients with hematospermia?			0.122[2]
A1. Age >40	19 (42.2%)	25 (44.6%)	
A2. Recurrent hematospermia	39 (86.7%)	43 (76.8%)	
A3. Accompanying hematuria	35 (77.8%)	45 (80.4%)	
A4. Palpable testicular mass	36 (80.0%)	44 (78.6%)	
A5. I request imaging for all patients	3 (6.7%)	15 (26.8%)	
A6. I never request imaging	0 (0%)	0 (0%)	
Q11. What is your most frequently preferred imaging modality in patients with hematospermia?			0.638[2]
A1. Scrotal ultrasound	16 (35.6%)	26 (46.4%)	
A2. Transrectal ultrasound	11 (24.4%)	19 (33.9%)	
A3. Urinary system ultrasound	30 (66.7%)	39 (69.6%)	
A4. Pelvic Magnetic Resonance Imaging	16 (35.6%)	22 (39.3%)	
A5. Computed tomography	0 (0%)	0 (0%)	

[1]: Fisher Exact test; [2]: Chi-square; Q: Question; A: Answer

6.7% of residents, who indicated that they perform a thorough evaluation in all patients due to the potential risk of malignancy. Only a few residents (4.4%) considered HS to be a benign and self-limiting condition requiring no further investigation. The differences between groups were not statistically significant (p=0.419) (**Table 4**).

In terms of the perceived impact of HS on patients' sexual lives, a substantial proportion of respondents believed that the condition caused anxiety and led to reduced sexual activity in most patients (residents: 64.4%, specialists: 46.4%). Others felt the impact was usually temporary (31.1% vs. 44.6%), while only a minority believed HS had no significant effect (2.2%

Table 3. Therapeutic and interventional approaches in the management of hematospermia among urology residents and specialists

	Resident (n:45)	Specialist (n:56)	P
Q12. What is the most important factor guiding your decision to initiate antibiotic therapy in a patient with hematospermia?			0.071[1]
A1. Presence of infectious findings	30 (66.7%)	26 (46.4%)	
A2. I start antibiotics for all patients at first visit	2 (4.4%)	7 (12.5%)	
A3. Presence of recurrent hematospermia	13 (28.9%)	19 (33.9%)	
A4. I do not initiate antibiotic therapy	0 (0%)	4 (7.1%)	
Q13. Which group of antibiotics do you generally prefer in patients with hematospermia?			**<0.001[1]**
A1. Quinolones	18 (40.0%)	45 (81.8%)	
A2. Trimethoprim-sulfamethoxazole	13 (28.9%)	7 (12.7%)	
A3. Tetracyclines	10 (22.2%)	3 (5.5%)	
A4. Broad-spectrum beta-lactams	4 (8.9%)	0 (0%)	
Q14. Which of the following diagnostic or therapeutic procedures have you previously performed for patients with hematospermia?			**0.001[2]**
A1. Transrectal aspiration of prostatic cyst	4 (8.9%)	13 (23.2%)	
A2. Seminal vesiculectomy	3 (6.7%)	3 (5.4%)	
A3. Diagnostic cystourethroscopy with fulguration of prostatic varices	2 (4.4%)	13 (23.2%)	
A4. Seminal vesiculoscopy	1 (2.2%)	5 (8.9%)	
A5. Transurethral incision of utricular cyst	5 (11.1%)	13 (23.2%)	
A6. I have not performed any surgical/interventional procedure	37 (82.2%)	32 (57.1%)	
Q15. Have you ever diagnosed malignancy in a patient followed for hematospermia?			0.382[2]
A1. Yes	8 (17.8%)	14 (25.0%)	
A2. No	37 (82.2%)	42 (75.0%)	

[1]: Fisher Exact test; [2]: Chi-square; Q: Question; A: Answer

and 7.1%, respectively). The difference in perceptions between residents and specialists did not reach statistical significance (p=0.232) (**Table 4**).

Discussion

Although HS is most often a benign and self-limiting finding, it continues to elicit heterogeneous clinical approaches and may impose considerable psychological burden on patients. The present study, based on responses from urologists across various institutions in Türkiye, revealed notable differences between specialists and residents in terms of diagnostic testing, antibiotic preferences, and attitudes toward interventional procedures, thereby highlighting the educational dimension of HS management.

International literature indicates that HS rarely requires extensive diagnostic evaluation. The 2025 guidelines of the European Association of Urology recommend further investigations only in men over 40 years of age, in cases of recurrent episodes, or when concomitant urinary symptoms are present [3]. Hakam et al. [4], in a large U.S. claims database analysis, reported that the association between HS and malignancy is exceedingly weak, with risks of 0.01% in individuals under 40 years and 0.11% in those aged 40 years and above. These findings suggest that aggressive diagnostic interventions are often unnecessary, particularly in younger patients. Nevertheless, persistent variation in test and imaging preferences among clinicians indicates that guideline recommendations are not fully translated into everyday practice and underscores the need for greater standardization within urology training programs.

Considerable heterogeneity is likewise observed in treatment strategies. Efesoy et al. [2] highlighted infection as the primary indication for initiating antibiotic therapy, while Dittmar et al. [5] demonstrated a strong association between epididymitis and HS, underscoring the pivotal role of infection in clinical decision-making. Yet, the tendency of some clinicians to rely on broad-spectrum regimens raises substantial concerns regarding antimicrobial resistance. Cinnamon et al. [6] reported that junior residents were more likely to prescribe broad-spectrum antibiotics compared with their senior counterparts, a finding not specific to HS but illustrative of how variability in prescribing practices may reflect broader knowledge gaps and shortcomings in educational mentorship. The relatively high preference for quinolone antibiotics, particularly among specialists, may reflect established prescribing habits or a lack of updated guidance specific to HS management. While quinolones are commonly used for urogenital infections, their widespread use raises concerns in the context of antibiotic stewardship and resistance development. These findings further underscore the need for

Table 4. General clinical attitudes and perceived psychosocial impact of hematospermia: comparison between urology residents and specialists

	Resident (n:45)	Specialist (n:56)	P
Q16. Which of the following best describes your overall approach to patients with hematospermia?			0.419[1]
A1. I generally consider it a benign and self-limiting condition; further investigation is not necessary	2 (4.4%)	0 (0%)	
A2. I primarily rule out infectious causes and recommend follow-up in most cases	9 (20.0%)	10 (17.9%)	
A3. My approach varies depending on the patient's age, accompanying symptoms, and overall clinical picture	31 (68.9%)	39 (69.6%)	
A4. I try to perform a thorough evaluation in all patients due to the possibility of malignancy	3 (6.7%)	7 (12.5%)	
Q17. Based on your clinical observations or patient feedback, do you think hematospermia affects patients' sexual life?			0.232[1]
A1. Yes, most patients feel anxious and reduce sexual activity	29 (64.4%)	26 (46.4%)	
A2. Some patients are temporarily affected	14 (31.1%)	25 (44.6%)	
A3. It has no significant effect on sexual life	1 (2.2%)	4 (7.1%)	
A4. I cannot comment on this matter	1 (2.2%)	1 (1.8%)	

[1]: Fisher Exact test; [2]: Chi-square; Q: Question; A: Answer

updated, evidence-based protocols and enhanced training on rational antibiotic use within urology education programs. Consistent with these observations, Sebel et al. [7], in their SWOT analysis of urology residency, emphasized that antibiotic stewardship, structured decision-making algorithms, and adherence to standardized protocols are still insufficiently incorporated into residency curricula. Similarly, Makarov et al. [8], in the American Urological Association consensus statement, underscored that shared decision-making—an essential component of patient-centered care—remains only partially integrated into urological practice and should be more robustly embedded within training programs.

Although HS is biologically of little clinical significance in most cases, its psychosocial impact is considerable. Gönültaş et al. [1], in a multicenter study, reported that a substantial proportion of patients diagnosed with HS experienced elevated levels of anxiety and adverse effects on sexual life. Similarly, Suh et al. [9] emphasized that despite its generally benign biological nature, HS can impose a significant psychological burden on patients. Moreover, Barry et al. [10] identified shared decision making as a cornerstone of patient-centered care, while Makarov et al. [8] highlighted that the application of this model in urological practice strengthens physician–patient interaction, enhances patient satisfaction, and promotes active engagement in the treatment process.

The strength of this study lies in its inclusion of clinicians from different levels of experience and institutional backgrounds across Türkiye. However, certain limitations should be acknowledged. As a survey-based study, the findings rely on self-reported data and may be subject to recall or reporting bias. In addition, the voluntary nature of participation may have introduced selection bias, since urologists with a particular interest in HS may have been more likely to respond. Furthermore, the relatively modest sample size may limit the representativeness of the findings at a national level. The exclusive inclusion of participants from Türkiye may also limit the generalizability of the results to other healthcare settings. Future prospective, multicenter, and observational studies integrating both self-reported information and objective clinical data would provide more robust evidence regarding diagnostic and therapeutic variations. Overall, the heterogeneous approaches to HS management observed in this study reflect not only clinical diversity but also educational gaps. Stronger integration of standardized diagnostic and therapeutic algorithms into residency curricula, enhanced awareness of antimicrobial resistance, and the development of communication skills remain essential to improve the quality of urology training and promote greater consistency in clinical practice.

Conclusion

This cross-sectional survey revealed considerable heterogeneity in the diagnostic and therapeutic approaches to HS among urology specialists and residents in Türkiye. While most participants reported adopting a symptom-based evaluation strategy, significant differences were noted between groups regarding the frequency of test requests, antibiotic preferences, and experience with surgical interventions. Recurrent HS and accompanying urinary symptoms were the most frequently reported indications for further investigation. Nevertheless, some respondents still considered HS to be a benign and self-limiting condition. Additionally, many urologists perceived HS as a factor that may negatively impact patients' sexual lives, highlighting the psychosocial dimension of the condition.

These findings, while limited by sample size, may help raise clinical awareness, identify educational needs, and inform the development of standardized guidelines for HS management. However, the cross-sectional design of the study and the voluntary nature of participation may introduce potential response bias and limit the generalizability of the results. Therefore, the results should be interpreted as exploratory and hypothesis-generating, and further studies with larger, representative samples are warranted.

Ethics Committee Approval: Ethical approval was obtained from the Ethics Committee of Haydarpaşa Numune Training and Research Hospital (Date: 17.06.2025, Protocol No: HNEAH-GOAEK/KK/2025/79).
Informed Consent: An informed consent was obtained from all the participants.
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Reliability and Quality Analysis of Kidney Cyst Videos on YouTube

YouTube'daki Böbrek Kisti Videolarının Güvenilirlik ve Kalite Analizi

Burak Köseoğlu[1], Mücahit Çaviş[2]

[1]Department of Urology, Polatli Duatepe State Hospital, Ankara, Türkiye
[2]Department of Urology, Etlik City Hospital, Ankara, Türkiye

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Corresponding Author: Burak Köseoğlu / Polatli Duatepe State Hospital, Department of Urology, Ankara, Türkiye / burakkoseoglu1993@gmail.com
ORCID ID: 0000-0001-7591-4497

Abstract

Objective: This study aimed to systematically evaluate the content, quality, and reliability of kidney cyst-related videos on YouTube, using expert assessments and validated scoring tools.
Materials and Methods: A YouTube search was performed on August 1, 2024, using the keywords "kidney cysts" and "renal cysts." The first 200 videos sorted by relevance were screened, and 147 eligible videos were included. Two independent urologists evaluated the videos using three validated tools: the Global Quality Scale (GQS), the modified DISCERN tool, and the Journal of the American Medical Association (JAMA) benchmark criteria. Videos were categorized by content type and source of upload. Descriptive statistics were reported, and appropriate tests were used to assess associations between video characteristics and quality scores.
Results: Of the 147 videos analyzed, 71.4% were uploaded by professional sources, and "symptoms and diagnostic methods" was the most common content type. The median scores were 3 for GQS, 2 for modified DISCERN, and 2 for JAMA. According to the modified DISCERN tool, 57.2% of the videos were classified as poor quality, 33.3% as moderate, and only 9.5% as good quality. Videos from professional sources had significantly higher quality scores across all three systems. Longer videos and those with higher numbers of likes and comments tended to score better. A strong correlation was observed among the three scoring systems.
Conclusion: Despite many videos being produced by professional sources, the overall quality and reliability of YouTube content on kidney cysts remain limited. Given YouTube's widespread use for health information, healthcare professionals should guide patients toward trustworthy resources. Future studies should focus on interventions to improve the accuracy and educational value of YouTube content.

Keywords: content reliability, health information quality, kidney cysts, social media, YouTube

Özet

Amaç: Bu çalışmanın amacı, YouTube'daki böbrek kistleri ile ilgili videoların içeriğini, kalitesini ve güvenilirliğini uzman değerlendirmeleri ve doğrulanmış puanlama araçları kullanarak sistematik olarak incelemektir.
Gereçler ve Yöntemler: 1 Ağustos 2024 tarihinde "böbrek kistleri" ve "renal kistler" anahtar kelimeleri kullanılarak YouTube'da bir arama gerçekleştirildi. İlgililiğe göre sıralanan ilk 200 video tarandı ve uygun bulunan 147 video çalışmaya dahil edildi. İki bağımsız ürolog, videoları üç doğrulanmış değerlendirme aracıyla inceledi: Global Kalite Skalası (GQS), modifiye DISCERN aracı ve Amerikan Tabipler Birliği Dergisi (JAMA) kriterleri. Videolar içerik türüne ve yükleyen kaynağa göre sınıflandırıldı. Tanımlayıcı istatistikler raporlandı ve video özellikleri ile kalite puanları arasındaki ilişkileri değerlendirmek için uygun testler kullanıldı.
Bulgular: Analiz edilen 147 videonun %71,4'ü profesyonel kaynaklar tarafından yüklenmişti ve en yaygın içerik türü "semptomlar ve tanı yöntemleri" idi. Medyan puanlar GQS için 3, modifiye DISCERN için 2 ve JAMA için 2 olarak bulundu. Modifiye DISCERN aracına göre videoların %57,2'si düşük, %33,3'ü orta ve yalnızca %9,5'i yüksek kalite olarak sınıflandırıldı. Profesyonel kaynaklardan yüklenen videolar, tüm puanlama sistemlerinde anlamlı şekilde daha yüksek puanlar aldı. Daha uzun videolar ve daha fazla beğeni ile yorum alanlar daha yüksek puanlara sahipti. Üç değerlendirme sistemi arasında güçlü bir korelasyon gözlendi.
Sonuç: Profesyonel kaynaklar tarafından üretilen birçok video bulunmasına rağmen, YouTube'daki böbrek kisti içeriklerinin genel kalite ve güvenilirliği hâlâ sınırlıdır. YouTube'un sağlık bilgisi için yaygın şekilde kullanıldığı göz önünde bulundurulduğunda, sağlık profesyonellerinin hastaları güvenilir kaynaklara yönlendirmesi önemlidir. Gelecekteki çalışmalar, YouTube içeriklerinin doğruluğunu ve eğitsel değerini artırmaya yönelik müdahalelere odaklanmalıdır.

Anahtar kelimeler: içerik güvenilirliği, sağlık bilgisi kalitesi, böbrek kistleri, sosyal medya, YouTube

ORCID ID: **M. Çaviş** 0009-0000-0354-5127

Introduction

Kidney cysts are one of the most common benign acquired kidney lesions [1]. Autopsy studies show that about half of patients aged 50 and older have a kidney cyst [2]. Population-based studies indicate that simple renal cysts occur in approximately 7-10% of the general population, and their prevalence increases with age, reaching up to 30% in individuals over 50 years [3]. Kidney cysts are classified according to imaging methods as simple kidney cysts and complex kidney cysts [4]. Kidney cysts are usually asymptomatic and are diagnosed incidentally.

Treatment is not necessary unless the cyst becomes infected or grows and causes symptoms. Treatment options for symptomatic benign renal cysts are cyst aspiration, surgical resection and sclerotherapy [5]. Although there is no evidence that any of the options is superior to the other; sclerotherapy and aspiration are associated with a higher incidence of cyst recurrence.

The internet, which started to be used in the second half of the twentieth century, has become the main source of obtaining information today. Especially social media platforms are the resources that patients and health professionals often use to access health information. Video is an effective way to demonstrate some content that cannot be easily explained in text form. YouTube (Google LLC, CA, USA), one of the most widely used social media platforms where users upload billions of hours of videos every day, was launched in 2005 [6]. YouTube can serve as educational tools for healthcare professionals, patients and their caregivers. However, videos are uploaded to this platform without any quality control and the information provided may be incorrect and misleading [7]. For this reason healthcare providers are concerned about the quality and standard of information on YouTube [8]. As a result, it is necessary to obtain information from sources of adequate quality and standard by evaluating the quality and standards of the content on YouTube.

Until this time, numerous studies in various medical fields have examined the quality and accuracy of YouTube videos, reporting that the content may range from highly informative to biased or misleading [9-11]. Within urology, the most popular topics seem to be urooncology and andrology [12-14]. Kidney cysts, which are usually detected incidentally in patients undergoing imaging for another reason, are a fairly common urological condition. Owing to their high prevalence, kidney cysts are also among the frequently searched conditions on the internet and social media platforms.

Despite the growing popularity of video-based medical learning, no prior studies have systematically assessed the quality of YouTube content on kidney cysts.

We hypothesized that YouTube videos related to kidney cysts would vary widely in quality and reliability, with a significant proportion lacking essential, accurate, or evidence-based information. Therefore, the aim of this study was to evaluate the content, reliability, and quality of kidney cyst-related videos available on YouTube.

Materials and Methods

On 1 August 2024, a YouTube (http://www.youtube.com) search was conducted using the terms "kidney cysts" and "renal cysts". The search and watch history were cleared beforehand to avoid algorithmic bias related to prior user interactions. No language or regional filters were applied; the search was performed using YouTube's default global settings. The first 200 videos sorted by "relevance" were screened. Non-English videos, duplicate videos, advertisements and videos without audio were excluded, leaving a total of 147 videos for analysis. All uploaders were anonymized to preserve confidentiality. Ethics committee approval was not required, as all data were publicly accessible and did not involve human subjects (Declaration of Helsinki exemption).

All videos were viewed and analyzed separately by two urology specialist one of whom is a board certified (Fellow of the European Board of Urology) urologist. Both authors were unaware of each other's evaluations. The numbers of days since the upload date, video duration, number of views, likes, number of comments were recorded for all videos. View ratio was calculated by dividing the number of views by days since the upload. Comment ratio was calculated in a similar way. The videos were divided into five categories according to the source of upload: "universities/professional organizations/physicians/nonprofit physicians", "stand-alone health information websites", "medical advertisements/for-profit-organizations", "patients/individual users" and "talk shows/TV programs". In addition they were grouped into five categories according to their contents: "anatomy/general information", "symptoms/diagnostic methods", "treatment/surgical procedure", "side effects/complications" and "patient/personal experience".

Quality and reliability assessment of the videos was employed using three tools. Global Quality Scale (GQS) for the overall quality, flow and usefulness assessment; modified DISCERN tool for the reliability assessment and Journal of American Medical Association (JAMA) score for information quality assessment [15-17].

The Global Quality Scale was used to evaluate the overall quality, flow and usefulness of the videos. Each video was scored on a scale from 1 to 5 across five different levels. Scores of 1 or 2 indicate poor quality, 3 indicates moderate quality and scores of 4 or 5 indicate good quality [15]. Videos with a rating of 1 are characterized by poor quality, poor flow, incomplete information and are not helpful for patients. Score 2 videos have the following characteristics: generally poor quality and the information given to patients is limited. Score 3 videos have moderate quality and some important information is adequately discussed. Videos with a score of 4 have good quality, good flow; most of the relevant information is covered, useful for patients. Score 5 videos exhibit excellent quality, excellent flow and very useful for patients.

The reliability evaluation of the videos was analyzed with the modified DISCERN score. The original DISCERN score, which was previously used to judge the quality of written consumer health information provided to patients, consists of 15 questions [16]. Modified DISCERN score used in this study consists of five yes/no questions. Each "yes" and "no" answers correspond to 1 and 0 points, respectively. Therefore, according to this scoring system, a maximum of five points can be obtained. The questions are listed as follows: (a) Are the aims of the video clear and achieved? (b) Are reliable sources of information used in videos? (c) Is the information in the videos balanced and unbiased? (d) Are additional sources of information listed

for patient reference? (e) Are areas of uncertainty mentioned in the videos? According to this scoring system, videos that score below 3 points indicate poor quality and useless resources for users. Videos with a score of 3 are considered to be of moderate quality and require additional sources of information. On the other hand, videos that score above 3 points demonstrate high quality and useful content for users.

The JAMA scoring system is a method of evaluating health-related website content. This scoring system includes four parameters (Currency, attribution, authorship and disclosure). Each parameter is possible 1 point, total possible score is 4 points [17]. Video quality is correlated with JAMA scoring, so the higher score means better quality content.

Statistical Analysis

Statistical analyses were performed using Statistical Package for the Social Sciences v27.0.1.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics for normally distributed variables were reported as mean ± standard deviation, whereas nonparametric or ordinal data were reported as median (IQR). The analysis of normally distributed variables was performed by one-way ANOVA; the analysis of non-normally distributed or ordinal variables was performed by the Kruskal-Wallis test. When significant differences were detected, pairwise comparisons were performed. Inter-rater agreement was evaluated with Kappa coefficient. Statistical significance was set at $p < 0.05$.

Results

A total of 147 videos that met the inclusion criteria were analyzed in this study. Table 1 shows the video characteristics. "Universities/professional organizations/physicians/nonprofit physicians" constituted the majority of source of the videos (71.4%). The majority of video content focused on "symptoms and diagnostic methods" (42.8%) (**Table 1**).

The median (interquartile range, IQR) scores for GQS, modified DISCERN and JAMA were 3 (2), 2 (2), and 2 (1), respectively (Table 1). According to GQS, 37.4% of the videos were evaluated as "poor" quality, 34% were "moderate" and 28.6% were "good" quality. For the modified DISCERN classification, 57.2% of the videos were evaluated as being of "poor" quality, 33.3% of them were "moderate" quality and 9.5% of them were "high" quality. For the JAMA score, 17.7% of the videos met the quality criteria when the cut-off limit was set to ≥3. The Cohen kappa score for GQS, modified DISCERN and JAMA were 0.850, 0.891 and 0.878 respectively. For all evaluations, the results show a high inter-rater reliability.

Table 2 presents the distribution of quality and reliability scores according to video upload source. Videos, categorized by upload source differed significantly in terms of quality and reliability criteria. GQS scores were significantly higher in videos that were uploaded by "universities/professional organizations/physicians/nonprofit physicians". According to the JAMA score, "universities/professional organizations/physicians/nonprofit physicians" sourced videos had a higher score than others, except for "medical advertisements/for-profit-organizations" sourced videos. The modified DISCERN score of videos uploaded by "universities/professional organizations/physicians/nonprofit physicians" was significantly higher than

Table 1. Characteristics and quality assessment of YouTube videos

Video features	**Min-Max**	**Mean (SD)**
Time since upload (day)	12 - 5139	1481.21 (1095.5)
Duration (sec)	12 - 3343	374.79 (509.2)
Number of views	17 - 6303179	71702.6 (521763.02)
View ratio	0.07 - 9941.9	95.3 (820.9)
Number of comments	1 - 3848	59.01 (330.1)
Comment ratio	0.00022 - 6.0694	0.09 (0.54)
Quality assessment	**Min-Max**	**Median (IQR)**
GQS	1 - 5	3 (2)
Modified DISCERN	1 - 5	2 (2)
JAMA score	1 - 4	2 (1)
Source of upload	**N**	**%**
Universities/professional organizations/physicians/ nonprofit physicians	105	71.4
Stand-alone health information websites	24	16.3
Medical advertisements/ for-profit-organizations	11	7.5
Patients/individual users	5	3.4
Talk shows/TV programmes	2	1.4
Video content	**N**	**%**
Anatomy and general information	39	26.5
Symptoms and diagnosis methods	63	42.8
Treatments and surgical procedure	37	25.2
Side effects and complications	1	0.7
Patient/personal experience	7	4.8
Accuracy of the information	**N**	**%**
True	137	93,2
False	10	6,8

GQS: Global quality score; IQR: Interquartile range; JAMA: Journal of the American Medical Association; Max: Maximum; Min: Minimum; SD: standard deviation

Table 2. Video quality assessments according to the source of the videos

	Universities/professional organizations/physicians/ nonprofit physicians	Stand-alone health information websites	Medical advertisements/ for-profit-organizations	Patients/ individual users	Talk shows/TV programmes	P*
JAMA score	2(1-4)	1(1-4)	2(1-3)	1(1-1)	1(1-1)	**< 0.001**
GQS	3(1-5)	2(1-4)	2(1-4)	2(1-3)	1(1-1)	**< 0.001**
Modified DISCERN	3(1-5)	2(1-3)	1(1-4)	1(1-1)	1(1-1)	**0.001**

GQS: Global quality score; JAMA; Journal of the American Medical Association. Note: Results are presented as median (min-max). Bold values indicate statistical significance. * Kruskal-Wallis test

"medical advertisements/for-profit-organizations" and "patients/ individual users".

When videos were classified into low, moderate, and high-quality groups according to the modified DISCERN score, significant differences were found in several video characteristics. These comparisons are detailed in **Table 3**. Video duration was significantly longer in higher quality videos ($p < 0.001$). Likewise, there were statistically significant differences in the number of likes ($p = 0.0003$) and the number of comments ($p = 0.0007$) among quality groups, with the highest number of comments observed in high-quality videos. Although high-quality videos were predominantly uploaded by professional sources, the association between video source and quality classification was not statistically significant ($p = 0.136$).

Correlation analysis showed a statistically significant and strong positive correlation between all three scoring systems. The full correlation coefficients are presented in **Table 4.** The strongest correlation was observed between modified DISCERN and GQS scores ($r = 0.74$, $p < 0.001$), followed by modified DISCERN and JAMA ($r = 0.63$, $p < 0.001$). Additionally, weak but statistically significant correlations were found between modified DISCERN scores and certain video characteristics, such as video duration ($r = 0.38$, $p < 0.001$), number of views ($r = 0.26$, $p = 0.0012$), view-per-day ratio ($r = 0.30$, $p = 0.0003$), number of likes ($r = 0.35$, $p < 0.001$), and number of comments ($r = 0.33$, $p < 0.001$) (**Table 4**).

Discussion

The use and popularity of social media platforms that produce video content have become increasingly widespread. YouTube, as one of the most prominent platforms, offers an extensive content library with billions of hours of videos uploaded daily. With the increasing use of imaging methods in

Table 3. Comparison of sources and video features according to modified DISCERN score

	Poor (n=84)	Moderate (n=49)	High (n=14)	P
Source type				0.136
Universities/professional organizations/physicians/nonprofit physicians	52 (61.9%)	40 (81.6%)	13 (92.9%)	
Stand-alone health information websites	17 (20.2%)	7 (14.3%)	0 (0.0%)	
Medical advertisements/for-profit-organizations	8 (9.5%)	2 (4.1%)	1 (7.1%)	
Patients/individual users	5 (6.0%)	0 (0.0%)	0 (0.0%)	
Talk shows/TV programmes	2 (2.4%)	0 (0.0%)	0 (0.0%)	
Video features				
Duration (sec)	247.15 ± 328.57	475.90 ± 611.02	786.71 ± 719.09	**< 0.001**
Number of views	97747.24 ± 689252.35	36104.92 ± 53624.49	40026.93 ± 58634.02	**0.0211**
View ratio	137.23 ± 1084.83	30.46 ± 49.38	71.01 ± 132.61	0.1801
Likes	3199.38 ± 27069.39	348.61 ± 571.15	1380.50 ± 2746.42	**0.0003**
Number of comments	58.24 ± 420.63	33.55 ± 62.66	152.79 ± 260.29	**0.0007**

Note: Results are presented as mean (± standard deviation). Bold values indicate statistical significance

Table 4. Correlation of JAMA, GQS and modified DISCERN scores with video features and each other

	JAMA		GQS		Modified DISCERN	
	r*	p	r*	p	r*	p
GQS	0.62	**< 0.001**	-	-	0.74	**< 0.001**
Modified DISCERN	0.63	**< 0.001**	0.74	**< 0.001**	-	-
Duration (sec)	0.30	**0.0002**	0.41	**< 0.001**	0.38	**< 0.001**
Number of views	0.23	**0.0061**	0.25	**0.0019**	0.26	**0.0012**
View ratio	0.20	**0.0147**	0.28	**0.0007**	0.30	**0.0003**
Likes	0.26	**0.0015**	0.33	**< 0.001**	0.35	**< 0.001**
Number of comments	0.23	**0.0057**	0.29	**0.0004**	0.33	**< 0.001**

GQS: Global quality score; JAMA: Journal of the American Medical Association. Bold value indicates statistically significance.
*Spearman p correlation coefficient

clinical practice, particularly during hospital admissions, the detection of incidental kidney cysts has also increased. Due to their high prevalence, kidney cysts have become one of the most frequently searched topics on the internet and social media platforms by patients and their caregivers. However, YouTube content can often be misleading or commercial [7]. Therefore, in this study, we aimed to evaluate the reliability and quality of kidney cyst-related videos available on YouTube.

To date, the reliability and quality of YouTube content have been evaluated in many medical fields, including urology [10,11,18,19]. However, to the best of our knowledge, no prior studies have been conducted on kidney cysts. This is the first study in the literature to evaluate the reliability and quality of kidney cyst-related videos available on YouTube.

In our analysis of 147 videos, the majority of video sources were "universities/professional organizations/physicians/nonprofit physicians" while the most commonly focused on topic was "symptoms and diagnostic methods." According to our findings, most YouTube videos related to kidney cysts were of poor quality, and their evaluation scores were notably low. Importantly, videos from "universities/professional organizations/physicians/nonprofit physicians" scored significantly higher in all quality measures compared to other sources. Additionally, video duration, number of likes, and number of comments were significantly higher in the high-quality group. Strong positive correlations were observed among the three scoring systems, particularly between modified DISCERN and GQS, while weak but statistically significant correlations were also found between video characteristics and quality scores.

The source of YouTube videos is highly important in terms of quality and reliability. A study that evaluated traumatic brain injury rehabilitation videos on YouTube found that most of the videos (65.3%) were uploaded by healthcare professionals or healthcare institutions [7]. Similarly, another study evaluating videos related to disc herniation identified physicians as the most common source of content [10]. In the field of urology, Uzundal et al. reported that the majority of YouTube videos related to Thulium Laser Enucleation of the Prostate were uploaded by urologists (54.5%), followed by private hospitals [20]. In line with these findings, a study on vesicoureteral reflux videos also revealed that hospitals and clinicians constituted the most common sources of content [8]. In our study, the majority of the videos (71.4%) were also uploaded by professional sources such as universities, professional organizations, physicians, or nonprofit healthcare providers, supporting the findings of previous literature.

When the video contents were evaluated, the most commonly observed topic in our study was "symptoms and diagnosis methods" (42.8%). This was followed by "anatomy and general information" (26.5%) and "treatments and surgical procedures" (25.2%). In a study conducted by Onder et al., YouTube videos related to gout were evaluated, and it was shown that the predominant video content was related to "gout diet" and "gout treatment", respectively [11]. Similar to our study, in the study analyzing videos related to testicular cancer, the most frequently identified content topic was "symptoms and diagnosis methods" (24.3%) [12]. In a study examining YouTube content on pediatric robotic pyeloplasty, "surgical technique" (70%) was the most prominent topic, followed by "disease/surgery information" (14%) [21]. It is plausible that the subjective nature of video evaluation and the diversity in medical fields and video topics contributed to the differences in content and sources reported across these studies.

YouTube does not implement any quality control for uploaded videos, which allows medical information to be frequently incorrect or misleading [7]. In a study evaluating YouTube videos related to disorders of sexual development, the accuracy rate of the information was 90% [9]. In contrast, a study assessing videos on self-testicular examination found that 36.6% of the videos contained misleading information [22]. In our study, although not all videos were of high quality, the overall accuracy rate was high (93.2%), likely due to the fact that the majority of the video sources were professional institutions and physicians.

Of the 147 videos evaluated in this study, the median scores GQS, modified DISCERN and JAMA were 3, 2, and 2 respectively. According to the modified DISCERN score, 57.2% of the videos were of "poor" quality, 33.3% were of

"moderate" quality, and 9.5% were of "good" quality. The other two scoring systems, GQS and JAMA, also indicated that the majority of the videos were of "poor" quality and exhibited lower reliability. In our study, "universities/professional organizations/physicians/nonprofit physicians" produced videos with the highest GQS scores and generally scored better than other sources across the JAMA and modified DISCERN scales. Similar to our findings, previous studies evaluating YouTube content have reported comparable [12,14,23]. In a study assessing YouTube videos about erectile dysfunction, more than 80% of the videos were reported to be of low to moderate quality, with a modified DISCERN score of 3 or less [13]. Similarly, another study on bladder cancer videos reported that 67% were of moderate to poor information quality [24]. Adorisio et al. found that DISCERN, JAMA, and GQS scores were significantly higher in videos originating from academics or physicians compared to those from other sources [21]. Contrary to previous studies, Culha et al. found no statistically significant differences between video groups in terms of evaluation metrics based on their publishing source [25]. Given the uncontrolled nature of YouTube and the absence of a peer-review mechanism, the platform tends to host a large number of low-quality or misleading videos. The quality of content appears to be strongly associated with the source of upload; in our study, nearly all high-quality videos were uploaded by healthcare professionals, professional organizations, or academic institutions.

While longer videos may provide more comprehensive information and foster greater reliability, various video-related metrics such as view count, number of like, and duration do not always correlate with higher content quality. In a study evaluating videos on testicular cancer, a significant correlation was observed between video length and evaluation scores, and "high quality" videos were found to be longer than the others [12]. Similarly, in another study evaluating videos on fibromyalgia, video length was found to be positively correlated with JAMA and DISCERN scores [26]. In contrast to these findings, no correlation was observed between video length and evaluation scores in a study analyzing videos on disc herniation [10]. In our study, video duration was significantly longer in higher quality videos. The highest number of comments was observed in these videos. In addition, weak but statistically significant correlations were found between the scoring systems and all video characteristics. Nonetheless, low-quality videos may receive more views, possibly due to their shorter duration, which may help retain viewer attention and reduce drop-off.

In the context of patient education, the quality of online medical content is particularly important, as many patients rely on YouTube as an initial source of information before seeking professional consultation. Individuals with lower digital health literacy may have difficulty distinguishing high-quality educational material from misleading or oversimplified content, increasing the risk of inappropriate self-management or unnecessary anxiety. Low-quality or inaccurate online information has been shown to contribute to patient confusion, heightened anxiety, and reduced trust in healthcare professionals, which may impair appropriate decision-making and delay timely medical consultation [27]. In urological contexts, such misleading content may amplify concerns about benign conditions like simple renal cysts or discourage proper follow-up. Therefore, improving the clarity, accuracy, and accessibility of online video content, alongside strengthening digital literacy initiatives and guiding patients toward verified, evidence-based resources, is essential for supporting safe and informed patient decision-making.

To the best of our knowledge, this is the first study to evaluate videos related to kidney cysts on YouTube, the most popular video-sharing platform, using expert opinions and validated scoring systems. However, the study has several limitations. One is its inherently subjective nature, which carries a risk of observer bias. To minimize this, two independent reviewers were involved, and validated scoring systems were employed. Another limitation of the study is that the search was restricted to the terms "kidney cysts" and "renal cysts," and only videos in English were considered for evaluation. Although video watch history was cleared to reduce bias, YouTube's geographical restrictions and user-related factors still posed limitations. Moreover, dislike counts were hidden by YouTube, preventing analysis of dislike/like ratios.

Conclusion

Findings from the systematic evaluation of kidney cyst-related videos on YouTube, indicate that although many videos originate from reputable sources, the overall content quality and reliability remain frequently inadequate. A significant portion of the videos is classified as low or moderate quality. Given YouTube's widespread use as a health information source among patients and caregivers, enhancing the accuracy and standards of kidney cyst-related content is imperative. Healthcare professionals should be aware of these limitations and guide patients toward trustworthy resources. Future efforts should focus on improving video quality and assessing the impact of online information on patient decision-making, including initiatives by urology specialists and professional organizations to develop reliable digital content.

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Prognostic Value of Computed Tomography Urography Contrast Enhancement in Predicting Grade and Muscle Invasion in Bladder Cancer

Bilgisayarlı Tomografi Ürografide Kontrastlanma Miktarının Mesane Kanserinde Tümör Derecesini ve Kas İnvazyonunu Tahmin Etmedeki Prognostik Değeri

Gökhan Şahin[1], Arif Kol[2], Mustafa Tıpırdamaz[2], Mustafa Gök[3]

[1] Department of Urology, Aydın State Hospital, Aydın, Türkiye
[2] Department of Urology, Aydın Adnan Menderes University, Aydın, Türkiye
[3] Department of Radiology, Aydın Adnan Menderes University, Aydın, Türkiye

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Corresponding Author: Gökhan Şahin / Aydın State Hospital, Department of Urology, Aydın, Türkiye / gokhansahinn7510@gmail.com/ ORCID ID: 0000-0002-1955-2679

Abstract

Objective: This study aimed to investigate the relationship between contrast enhancement on computed tomography (CT) urography and tumor grade, recurrence, and muscle invasion in patients who underwent CT urography for hematuria and were found to have bladder tumors.
Materials and Methods: A total of 70 patients diagnosed with bladder cancer between February 2022 and February 2023 were prospectively included in the study. Preoperative CT urography was performed in all patients. Hounsfield unit (HU) measurements were obtained from the tumor in both non-contrast and nephrographic phases. The difference between these values was defined as the contrast enhancement level. The association between contrast enhancement and tumor grade, recurrence, and muscle invasion was statistically analyzed.
Results: High-grade bladder tumors were identified in 46 patients, while 24 had low-grade tumors. The contrast enhancement values were significantly higher in high-grade tumors compared to low-grade tumors (28.9 ± 11.8 HU vs. 17 ± 10.3 HU, $p < 0.01$). Among the 16 patients who experienced tumor recurrence, the enhancement values were significantly higher than those without recurrence (30.3 ± 10.5 HU vs. 23.2 ± 12.8 HU, $p < 0.05$). In cases of muscle-invasive tumors, contrast enhancement levels were significantly higher than those in non-muscle-invasive tumors (41.75 ± 4.8 HU vs. 22.6 ± 11.6 HU, $p < 0.01$). ROC analysis revealed a threshold value of 19.5 HU for distinguishing high- and low-grade tumors (sensitivity: 80%, specificity: 75%), and 36 HU for detecting muscle invasion (sensitivity: 100%, specificity: 84%). According to the multivariate logistic regression analysis, contrast enhancement was identified as an independent risk factor for high-grade bladder tumors (OR = 1.09, 95% CI: 1.031–1.152, $p = 0.02$).
Conclusion: The amount of contrast enhancement observed in preoperative CT urography of bladder tumors may serve as a useful imaging biomarker for assessing tumor aggressiveness and preoperative risk stratification.. Further studies with larger patient cohorts are needed to validate these findings.

Keywords: bladder cancer, CT urography, contrast enhancement, tumor grade, muscle invasion, prognosis

Özet

Amaç: Çalışmanın amacı, hematüri nedeniyle preoperatif dönemde gerçekleştirilen bilgisayarlı tomografi (BT) -ürografi incelemesinde mesane tümörlerinin kontrast tutulum düzeyinin; tümör derecesi, tümöral nüks ve kas invazyonu ile ilişkisini değerlendirmektir.
Gereçler ve Yöntemler: Şubat 2022 – Şubat 2023 tarihleri arasında mesane kanseri tanısı almış 70 hasta prospektif olarak çalışmaya dahil edildi. Tüm hastalara preoperatif BT-ürografi uygulandı. Kontrastsız ve nefrogram fazlarındaki görüntülerde, mesane tümöründen Hounsfield unit (HU) cinsinden ölçümler yapıldı. Bu iki değer arasındaki fark kontrast tutulum miktarı olarak tanımlandı. Elde edilen veriler, tümör derecesi (yüksek/düşük), nüks gelişimi ve kas invazyonu ile istatistiksel olarak karşılaştırıldı.
Bulgular: Yüksek dereceli tümör tespit edilen 46 hastada kontrast tutulum değeri, düşük dereceli 24 hastaya kıyasla anlamlı derecede daha yüksek bulundu (28.9 ± 11.8 HU vs. 17 ± 10.3 HU; $p < 0.01$). Tümöral nüks gelişen 16 hastada kontrastlanma miktarı, nüks gözlenmeyen hastalara göre anlamlı düzeyde daha yüksekti (30.3 ± 10.5 HU vs. 23.2 ± 12.8 HU; $p < 0.05$). Kas invaziv tümörlerde kontrast tutulum değeri, yüzeyel tümörlere göre anlamlı derecede yüksek bulundu (41.75 ± 4.8 HU vs. 22.6 ± 11.6 HU; $p < 0.01$). ROC analizi sonucunda; yüksek ve düşük dereceli tümörleri ayırt etmede 19.5 HU (duyarlılık: %80, özgüllük: %75), kas invazyonunu ayırt etmede ise 36 HU (duyarlılık: %100, özgüllük: %84) eşik değerleri saptandı. Çok değişkenli lojistik regresyon analizine göre, kontrast tutulumu yüksek dereceli mesane tümörleri için bağımsız bir risk faktörü olarak saptanmıştır (OR = 1.09, %95 GA: 1.031–1.152, $p = 0.02$).
Sonuç: Mesane tümörlerinde BT-ürografi tetkiki ile saptanan kontrastlanma miktarı, tümör derecesi ve kas invazyonu ile anlamlı ilişki göstermektedir ve nüks gelişen hastalarda daha yüksek değerler izlenmiştir. Daha geniş hasta serileri ile yapılacak ileri düzey çalışmalar, bu yöntemin cerrahi öncesi risk sınıflamasında biyogösterge olarak kullanımını destekleyebilir.

Anahtar kelimeler: mesane kanseri, BT ürografi, kontrast tutulumu, tümör derecesi, prognoz

ORCID ID: **A. Kol** 0000-0002-3682-3661 **M. Tıpırdamaz** 0000-0002-5670-3069 **M. Gök** 0000-0001-7021-0984

Introduction

Bladder cancer is the tenth most common malignancy worldwide and is associated with a high mortality rate if left untreated [1]. It is classified into two major categories: non-muscle invasive bladder cancer (NMIBC) and muscle-invasive bladder cancer (MIBC), with NMIBC accounting for the majority of cases. NMIBC includes mucosa-limited (pTa), lamina propria-invasive (pT1), and carcinoma in situ (CIS) stages. If untreated, approximately 50% of NMIBC cases progress to MIBC. Additionally, the recurrence rate after treatment remains high, ranging from 70% to 80% [2].

Ultrasonography (USG) and computed tomography (CT) urography are commonly used for the diagnosis of urinary tract pathologies. While USG is useful for detecting intra-bladder tumors, assessing hydronephrosis, and characterizing renal tumors, it is limited in its ability to identify upper urinary tract tumors [3]. CT urography is typically performed in three phases: the non-contrast phase, the nephrographic phase (with an 80–120 second delay), and the excretory phase (with a 10–15 minute delay) [4]. It is highly sensitive for detecting renal masses and identifying filling defects within the urinary collecting system [5,6].

Neoplastic tissues are known to exhibit high vascularization to support proliferation and maintain viability [7]. The angiogenic activity of malignant tissues is believed to have prognostic significance. Studies assessing the vascularization of bladder and renal pelvis tumors have demonstrated an association between tumoral vascularization and tumor grade, stage, and prognosis [8,9]. In these studies, vascularization was typically evaluated using immunohistochemical staining, vessel quantification, or contrast-enhanced imaging techniques [10-13].

Contrast enhancement techniques have emerged as valuable methods for assessing bladder cancer, offering insights into tumor aggressiveness and aiding in staging and grading. Contrast-enhanced ultrasound (CEUS) has been explored for its diagnostic accuracy in differentiating between muscle-invasive and non-muscle-invasive bladder cancer, offering a cost-effective and safe imaging alternative [14,15]. Contrast enhancement observed in CT urography has been demonstrated to correlate with tumor vascularization and histological grade [13].

This study aimed to assess the prognostic significance of contrast enhancement in CT urography for bladder cancer.

Materials and Methods

Patients

Between February 2022 and February 2023, a total of 78 patients who presented with hematuria and were subsequently diagnosed with bladder tumors on CT urography were prospectively evaluated. Preoperative CT urography was performed in all patients, and tumor characteristics, including tumor size and contrast enhancement, were measured prior to surgical intervention and pathological evaluation.

Patients with contrast allergy (n=3), those whose pathology results indicated papilloma (n=2), and those who underwent single-phase intravenous contrast-enhanced CT (n=3) were excluded from the study. Consequently, 70 patients who met the inclusion criteria were included in the final analysis.

CT measurements were performed using contrast-enhanced CT urography images obtained before surgery. The degree of contrast enhancement of the bladder tumor was recorded and later compared with the pathological tumor grade obtained after transurethral resection of the bladder tumor (TURBT).

Patients were followed postoperatively through routine cystoscopic surveillance for tumor recurrence. For the purpose of analysis, patients who developed tumor recurrence within the first 12 months of follow-up were recorded as recurrence cases.

Written informed consent was obtained from all patients. Ethical approval was granted by the local ethics committee (Decision No: 12, Protocol No: 2021/193).

CT Urography Protocol and Measurement of Contrast Enhancement

All CT scans were obtained using a 128-detector CT scanner (Aquilion Prime, Toshiba Medical Systems, Otawara, Japan). All patients were instructed to consume 500 mL of water one hour before the CT scan to ensure adequate bladder distension. Following the acquisition of the non-contrast phase, 100 mL of a non-ionic contrast agent (Opaxol 350 mg/mL) was administered intravenously. Nephrographic phase images were acquired at 70 seconds, while pyelographic phase images were obtained at 300 seconds.

CT attenuation measurements were performed on preoperative CT urography images prior to surgical intervention and pathological evaluation. Attenuation values of the bladder

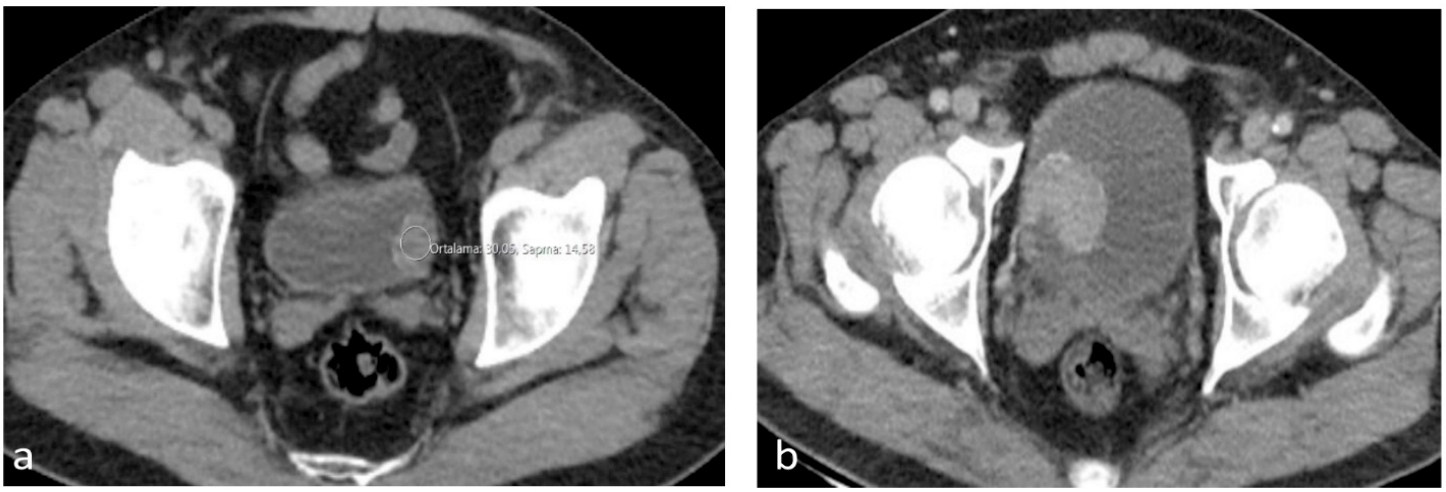

Figure 1. Acquisition of axial images and measurements of contrast enhancement of bladder tumors in (a) non-contrast and (b) nephrographic phases

tumors were measured in Hounsfield units (HU) at the non-contrast and nephrographic phases using regions of interest (ROI). Attenuation was assessed on a single axial image at the level of the maximum tumor diameter. The largest possible circular ROI was placed at the center of the tumor to minimize partial volume effects and to avoid including the surrounding bladder wall or urine (**Figure 1**).

All measurements were performed by a radiologist who was blinded to the pathological results. Each measurement was performed twice in two separate sessions, and the mean value of the two measurements was used for the final analysis. The difference between the attenuation values obtained from the nephrographic and non-contrast phases was defined as the CT enhancement value.

Statistical Analysis

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 25.0 software (IBM Corporation, Armonk, NY, USA). The normality of the data distribution was assessed using the Shapiro–Wilk test. The relationship between CT enhancement values and tumor grade was analyzed using the Mann–Whitney U test. Receiver operating characteristic (ROC) analysis was performed to determine the optimal cut-off value.

Multivariate logistic regression analysis was performed to identify independent predictors of high-grade urothelial carcinoma. Variables included in the multivariate model were selected based on their clinical relevance and the objective of the study, which was to evaluate the predictive value of preoperative CT urography findings. To reduce the risk of model overfitting given the relatively limited sample size, the number of variables included in the model was restricted.

Data were presented as mean ± standard deviation. All variables were analyzed with a 95% confidence interval, and a p value <0.05 was considered statistically significant.

Results

Of the 70 patients included in the study, 46 were diagnosed with high-grade (HG) and 24 with low-grade (LG) urothelial carcinoma. A total of 62 patients were diagnosed with NMIBC, while 8 patients were diagnosed with MIBC. The cohort consisted of 64 male and 6 female patients, with a mean age of 66.8 ± 10 years. The mean age was significantly higher in the high-grade group (69.3 ± 9 years) compared to the low-grade group (62 ± 9.9 years) (p <0.01). Additionally, the mean tumor size was significantly larger in the high-grade group (37 ± 21 mm) than in the low-grade group (21.5 ± 14 mm) (p <0.01) (**Table 1**).

Table 1. Comparison of the groups based on tumor size and demographic characteristics

	Age	**Tumor size (mm)**	**Gender Men Women**
Low grade (LG) (%) N=24	62±9.9	21.5±14	22 (%91.6) 2 (%8.4)
High grade (HG) (%) N=46	69.3±9	37±21	42 (%91.3) 4 (%8.7)
P	**<0.01**	**<0.01**	0.6

The mean CT enhancement value was 28.9±11.8 HU in the high-grade group and 17±10.3 HU in the low-grade group. Contrast enhancement was found to be significantly higher in the high-grade group compared to the low-grade group (p <0.01). Tumor recurrence was observed in 16 patients, while 54 patients had no recurrence. The mean CT enhancement value was 30.3±10.5 HU in the recurrence group and 23.2±12.8 HU in the non-recurrence group. Tumor contrast enhancement was significantly higher in patients with recurrence (p <0.05) (**Table 2**).

ROC curve analysis demonstrated that the degree of contrast enhancement in bladder tumors could effectively differentiate between high-grade and low-grade urothelial carcinoma. Using the Youden Index, the optimal cut-off value for CT enhancement was determined to be 19.5 HU, with a sensitivity of 80% and a specificity of 75% (AUC: 0.76, p <0.01, 95% CI: 0.635–0.885) (**Figure 2**).

The mean contrast enhancement was 41.75±4.8 HU in patients with muscle-invasive bladder cancer and 22.6±11.6 HU in patients with superficial bladder cancer. Contrast enhancement was significantly higher in the muscle-invasive group. ROC curve analysis indicated that contrast enhancement on CT urography can effectively differentiate between muscle-invasive and superficial bladder cancer. The optimal cut-off value for CT enhancement was 36 HU, with a sensitivity of 100% and a specificity of 84%. (AUC: 0.927, p <0.01, 95% CI: 0.865–0.990) (**Figure 2**). The demographic data and contrast enhancement characteristics of patients with invasive and superficial bladder cancer are summarized in **Table 3**.

A multivariate logistic regression model was constructed to identify independent predictors of high-grade tumors. Contrast enhancement, age, gender, and tumor size were included as covariates in the model. The results demonstrated that both contrast enhancement and age were independently associated

Table 2. Association of contrast enhancement in CT urography phases with tumor grade and recurrence status

	High grade n: 46	**Low grade n: 24**	**p**	**Recurrence n: 16**	**Recurrence free n: 54**	**P**
Non-contrast phase attenuation (HU)	33.9±11.1	30.25±9.2	0.18	28.7±8.1	33.8±11	0.13
Nephrogram phase attenuation (HU)	62.9±12.1	47.2±12.5	<**0.05**	59.1±9.2	57±15.5	0.14
CT enhancement value (HU)	28.9±11.8	17±10.3	**<0.01**	30.3±10.5	23.2±12.8	**<0.05**

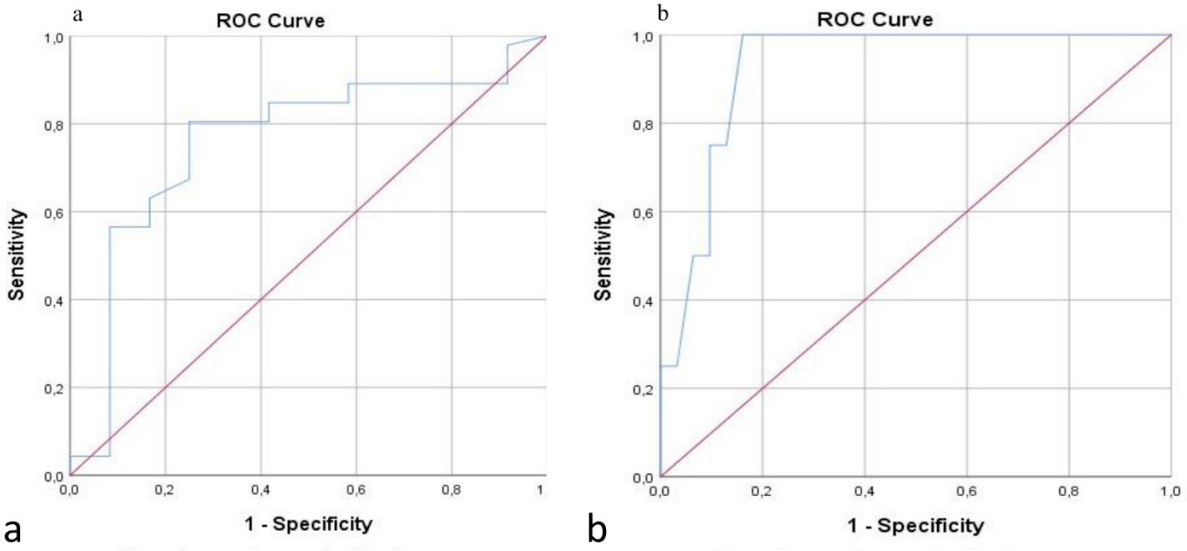

Figure 2. a) ROC curves for differentiation of low- and high-grade bladder cancer with mean CT enhancement value
b) ROC curves for differentiation of invasive and superficial bladder cancer with mean CT enhancement value

with high-grade tumors (OR = 1.09, 95% CI: 1.031–1.152, p = 0.02; OR = 1.081, 95% CI: 1.007–1.160, p = 0.03, respectively).

A separate multivariate logistic regression model was constructed to identify predictors of tumor recurrence. Tumor grade, tumor number (solitary vs. multiple), tumor size, and contrast enhancement were included as covariates. In this analysis, tumor number emerged as an independent risk factor for recurrence (OR = 7.979, 95% CI: 2.004–31.766, p <0.01).

Discussion

Accurate grading and staging of bladder cancer and the assessment of prognostic factors play a critical role in guiding urologists in selecting the appropriate surgical and postoperative treatment strategies. Low-grade bladder cancer, characterized by slow progression and lower malignant potential, is typically treated with TURBT, often followed by intravesical therapy with agents such as mitomycin and epirubicin. In contrast, high-grade and muscle invasive bladder cancer frequently requires radical cystectomy, with postoperative Bacillus Calmette–Guérin (BCG) therapy or more intensive treatment approaches [16,17]. Tumor stage and histopathological grade are the most critical prognostic factors influencing the survival of bladder carcinoma [18]. Understanding the biological behavior of the disease is crucial for selecting the most appropriate treatment modality and optimizing patient outcomes. Therefore, differentiating the tumor grade and histopathological stage of bladder urothelial carcinoma is essential for optimizing patient management and improving clinical outcomes.

Table 3. The Demographic data and contrast enhancement characteristics of patients with invasive and superficial bladder cancer

	Age	Tumor size (mm)	Gender Men Women	CT enhancement value (HU)
Superficial (%) N=62	66.3±10.3	28.8±19.3	56 (%90.4) 6 (%9.6)	22.6±11.6
Invasive (%) N=8	70.5±5.3	54.7±12.9	8 (%100) 0	41.75±4.8
P	**P<0.09**	**P<0.01**	0.35	**P<0.01**

CT urography is widely utilized for its high diagnostic accuracy in evaluating the etiology of hematuria and detecting bladder tumors [19]. There is currently no universally accepted standard protocol or established national and institutional guidelines for CT urography, leading to significant variability in acquisition techniques and contrast administration protocols [20,21]. CT urography is typically performed in three phases: a non-contrast phase, a nephrographic phase acquired 80–120 seconds after contrast administration, and an excretory phase obtained 5–15 minutes post-injection [22]. Maximum contrast enhancement of bladder tumors has been observed between 60 and 80 seconds after contrast agent administration [23].

In line with previous studies using contrast-enhanced imaging, our findings demonstrate that contrast enhancement in bladder cancer may help differentiate between low- and high-grade tumors and serves as an independent predictor of high-grade disease.

Studies evaluating contrast enhancement of bladder tumors using CT urography are limited. The predictive value of tumor contrast enhancement has mostly been investigated using contrast-enhanced ultrasonography. Previous studies have demonstrated that CEUS can effectively differentiate between high-grade and low-grade bladder tumors [24,25]. Nevertheless, contrast-enhanced ultrasonography has been shown to be a useful tool in the T staging of bladder cancer and may aid in the detection of muscle invasion [26,27].

Tumor tissues typically demonstrate greater vascularization than normal tissues, which supports tumor proliferation and sustains cellular survival. Accumulating evidence indicates that the progression and metastatic potential of tumors are closely related to their ability to promote neovascularization [28]. Previous studies have shown that microvessel density is

associated with tumor aggressiveness [29]. Malignant tissues often demonstrate greater contrast enhancement than normal tissues in contrast-enhanced imaging, which is largely attributed to increased tumor vascularization. The formation of new blood vessels results in physiological alterations, including elevated perfusion, increased blood volume, and greater capillary permeability, all of which influence the degree of contrast enhancement observed on computed tomography [30].

Previous studies have suggested that contrast enhancement characteristics obtained from imaging modalities may reflect the biological behavior of tumors. Cai Feng Wan et al. proposed that the contrast enhancement pattern observed on contrast-enhanced ultrasound in patients with breast cancer could serve as a non-invasive biomarker of tumor characteristics [31]. Similarly, in a study evaluating contrast-enhanced ultrasound in prostate cancer patients, peak intensity values were found to be significantly associated with gleason score and microvessel density (MVD). These findings support the concept that imaging-based contrast enhancement parameters may indirectly reflect tumor vascularity and aggressiveness. Consistent with these observations, our study demonstrated that contrast enhancement values obtained from CT urography were associated with tumor grade and recurrence in bladder cancer patients [32].

Studies investigating the role of CT urography in the diagnosis of bladder cancer have shown that it can be used with high accuracy for detecting bladder cancer [33,34]. In the study conducted by Xie et al., contrast enhancement observed on contrast-enhanced CT in bladder cancer was reported to show a positive correlation with tumor grade and MVD [13]. In a meta-analysis investigating MVD as a prognostic marker in bladder cancer, high microvessel density was found to be associated with poor survival outcomes, suggesting its potential role as a prognostic indicator [35].

From a clinical perspective, imaging markers that provide information about tumor aggressiveness before surgery may contribute to improved risk stratification and treatment planning in patients with bladder cancer. Preoperative assessment of contrast enhancement on CT urography may help clinicians anticipate the likelihood of high-grade disease or muscle invasion and may assist in guiding clinical decision-making and follow-up strategies. However, further prospective studies with larger patient populations are required to confirm the clinical utility of CT enhancement as a prognostic imaging biomarker.

The 2006 European Organisation for Research and Treatment of Cancer (EORTC) scoring model predicts short- and long-term recurrence and progression risks in bladder cancer based on six key factors: number of tumors, tumor size, prior recurrence rate, T category, presence of concurrent CIS, and World Health Organization (WHO) 1973 tumor grade [36]. Predicting recurrence and progression in bladder cancer may contribute to the personalization of treatment and follow-up strategies, potentially reducing unnecessary cystoscopies in low-risk patients while enabling closer surveillance in high-risk cases.

In the present study, contrast enhancement values were higher in patients who developed tumor recurrence. However, in the multivariate logistic regression analysis, tumor number emerged as the only independent predictor of recurrence. This finding suggests that the association between contrast enhancement and recurrence observed in the univariate analysis may be influenced by other clinicopathological factors. Therefore, contrast enhancement alone may not be sufficient to serve as an independent prognostic biomarker for recurrence. These findings should be interpreted with caution, and further studies with larger patient cohorts are warranted to better clarify the potential prognostic role of CT contrast enhancement in predicting bladder tumor recurrence.

Taken together, the findings of this prospective study suggest that contrast enhancement measured on CT urography may provide valuable information about the biological behavior of bladder tumors. Higher enhancement values were associated with high-grade disease and muscle invasion, supporting the concept that imaging-based vascular characteristics may reflect tumor aggressiveness. As CT urography is already widely used in the evaluation of hematuria, quantitative assessment of contrast enhancement may offer an additional non-invasive parameter for preoperative risk assessment. Nevertheless, further prospective studies with larger patient populations are required to validate these findings and to determine the potential role of CT enhancement parameters in clinical decision-making.

The present study has several limitations. First, the number of patients with muscle-invasive bladder cancer was relatively small, which may limit the generalizability of the findings regarding muscle invasion. Second, this was a single-center study with a limited sample size, which may introduce potential selection bias. Third, CT attenuation measurements were performed by a single radiologist; although measurements were repeated in two separate sessions and the mean value was used for analysis, interobserver variability could not be evaluated. Finally, the use of a single ROI measurement from the tumor center may not fully reflect the potential heterogeneity of bladder tumors.

Conclusion

Contrast enhancement on CT urography was significantly associated with tumor grade and showed higher values in patients with recurrence. While it independently predicted high-grade disease, it was not identified as an independent predictor of recurrence. These findings suggest that contrast enhancement may serve as a useful imaging marker for tumor aggressiveness.

Ethics Committee Approval: This study was approved by the Aydın Adnan Menderes University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee (Decision No: 12, Protocol No: 2021/193).
Informed Consent: Written informed consent was obtained from all patients.
Publication: The results of the study were not published in full or in part in form of abstracts.
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Authorship Contributions: Any contribution was not made by any individual not listed as an author. Concept – G.Ş., A.K., M.T.; Design – G.Ş., A.K., M.G.; Supervision – A.K., M.G.; Resources – G.Ş., A.K.; Materials – G.Ş., M.T.; Data Collection and/or Processing – G.Ş., A.K., M.T., M.G.; Analysis and/or Interpretation – G.Ş., A.K., M.T., M.G.; Literature Search – G.Ş., A.K., M.T., M.G.; Writing Manuscript – G.Ş.; Critical Review – G.Ş., A.K., M.T.

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Impact of Circumcision Performed Under Local or General Anesthesia During the Phallic Stage on Adult Male Genital Self-Image

Fallik Dönemde Lokal veya Genel Anestezi Altında Yapılan Sünnetin Yetişkin Erkeklerin Genital Öz İmajına Etkisi

Kenan Yalçın[1], Vildan Kölükçü[2]

[1]Department of Urology, Tokat Gaziosmanpaşa University, Tokat, Türkiye
[2]Department of Anesthesiology and Reanimation, Tokat Gaziosmanpaşa University, Tokat, Türkiye

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Corresponding Author: Kenan Yalçın / Tokat Gaziosmanpaşa University, Department of Urology, Tokat, Türkiye / krsyalcin@yahoo.com
ORCID ID: 0000-0003-3560-5862

Abstract

Objective: The optimal timing of circumcision during childhood and the preferred method of anesthesia remain subjects of ongoing debate. This study aimed to investigate the long-term potential effects of local versus general anesthesia administered during circumcision performed in the phallic stage on adult male genital self-image scores.
Materials and Methods: A total of 84 male individuals who had undergone circumcision during the phallic stage were included in the study. Participants were divided into two groups based on the anesthesia type administered during the procedure: Group 1 received general anesthesia, while Group 2 received local anesthesia. Sociodemographic characteristics, including age, marital status, and educational background, were recorded. Additionally, body mass index (BMI), age at circumcision, indications for the procedure, and post-circumcision complications were analyzed. Each participant was assessed using the Beck Depression Inventory (BDI), the International Index of Erectile Function (IIEF-15), and the Male Genital Self-Image Scale (MGSIS-7).
Results: The mean age of participants did not differ significantly between groups ($p > 0.05$). Similarly, there were no significant intergroup differences in terms of circumcision age, BMI, indication for the procedure, or complication rates ($p > 0.05$). Moreover, IIEF-15 and BDI scores also showed no statistical differences between the two groups ($p > 0.05$). However, the mean MGSIS-7 score was significantly lower in the local anesthesia group compared to the general anesthesia group ($p < 0.0001$), indicating a less positive genital self-image among those circumcised under local anesthesia.
Conclusion: Circumcision performed under local anesthesia during the phallic stage may be associated with a more negative adult male genital self-image compared to procedures performed under general anesthesia. These findings highlight the potential psychological impact of anesthesia type during this sensitive developmental period and warrant further investigation.

Keywords: phallic stage, local anesthesia, general anesthesia, genital self-image

Özet

Amaç: Çocukluk döneminde sünnetin en uygun zamanı ve tercih edilen anestezi yöntemi, halen tartışma konusu olmaya devam etmektedir. Bu çalışma, fallik aşamada yapılan sünnet sırasında uygulanan lokal anestezi ile genel anestezinin yetişkin erkeklerin genital öz imaj puanları üzerindeki uzun vadeli potansiyel etkilerini araştırmayı amaçlamıştır.
Gereçler ve Yöntemler: Fallik dönemde sünnet olan toplam 84 erkek birey çalışmaya dahil edildi. Katılımcılar, işlem sırasında uygulanan anestezi türüne göre iki gruba ayrıldı: Grup 1 genel anestezi alırken, Grup 2 lokal anestezi aldı. Yaş, medeni durum ve eğitim düzeyi gibi sosyodemografik özellikler kaydedildi. Ek olarak, vücut kitle indeksi (BMI), sünnet yaşı, işlem endikasyonları ve sünnet sonrası komplikasyonlar analiz edildi. Her katılımcı Beck Depresyon Envanteri (BDI), Uluslararası Erektil Fonksiyon Endeksi (IIEF-15) ve Erkek Genital Öz İmaj Ölçeği (MGSIS-7) kullanılarak değerlendirildi.
Bulgular: Katılımcıların ortalama yaşları gruplar arasında önemli bir fark göstermedi ($p > 0,05$). Benzer şekilde, sünnet yaşı, BMI, işlem endikasyonu veya komplikasyon oranları açısından gruplar arasında önemli bir fark yoktu ($p > 0,05$). Ayrıca, IIEF-15 ve BDI puanları da iki grup arasında istatistiksel olarak anlamlı bir fark göstermedi ($p > 0,05$). Ancak, ortalama MGSIS-7 puanı genel anestezi grubuna kıyasla lokal anestezi grubunda anlamlı olarak daha düşüktü ($p < 0,0001$), bu da lokal anestezi altında sünnet olanların genital öz imajlarının daha az olumlu olduğunu göstermektedir.
Sonuç: Fallik dönemde lokal anestezi altında yapılan sünnet, genel anestezi altında yapılan işlemlerle karşılaştırıldığında, yetişkin erkeklerin genital organlarına ilişkin daha olumsuz bir öz imajla ilişkilendirilebilir. Bu bulgular, bu hassas gelişim döneminde anestezi türünün potansiyel psikolojik etkisini vurgulamakta ve daha fazla araştırma yapılmasını gerektirmektedir.

Anahtar kelimeler: fallik dönem, lokal anestezi, genel anestezi, genital öz-imaj

ORCID ID: **V. Kölükçü** 0000-0002-3914-3899

Introduction

Circumcision is one of the oldest and most widely practiced surgical procedures worldwide, performed for religious, cultural, or medical reasons. It is estimated that approximately 30–33% of men aged 15 years and older have undergone circumcision globally [1]. The procedure involves the surgical removal of the foreskin covering the glans penis. Despite being commonly performed, circumcision should not be regarded as a simple or minor intervention. The accurate identification of excision margins, strict adherence to antiseptic principles, and the provision of adequate analgesia and anesthesia are all essential for ensuring safe and optimal surgical outcomes [2].

The optimal timing for circumcision remains of topic of ongoing debate in both clinical and sociocultural contexts [3]. Similarly, there is no universally accepted or standardized protocol regarding the choice of anesthesia [4]. In Freudian psychoanalytic theory the so-called "phallic stage", between three and six years of age, represents a critical developmental period during which children begin to form their gender identity, establish body awareness, and internalize attitudes toward sexuality and the body [3]. Although there is a lack of high-level evidence from large-scale studies or meta-analyses, a significant proportion of healthcare professionals express concern about performing circumcision during this stage due to its potential association with castration anxiety, body image disturbances, and adverse psychosexual outcomes [1,3]. Nevertheless, circumcision during this developmental period remains common in many cultures, particularly when performed under local anesthesia for religious or traditional reasons. In pediatric patients within this age group, the procedure may trigger feelings of fear and anxiety, which could potentially contribute to long-term psychological consequences [5,6].

To the best of our knowledge, this is the first study in the English-language literature to examine the long-term effect of the anesthesia type administered during circumcision in the phallic stage on adult male genital self-image.

Materials and Methods

The study was approved by the Local Ethics Committee of Tokat Gaziosmanpaşa University Faculty of Medicine (Approval No: 25-MOBAEK 241, Date: June 17, 2025). The research protocol adhered to the principles of the Declaration of Helsinki, and written informed consent was obtained from all participants before inclusion in the study.

The prospective observational study was conducted during January and March 2025 in our clinic. A total of 84 young adult males who presented for routine follow-up and had a documented history of circumcision performed during the phallic stage were included. Patients were attending follow-up for urinary system stone disease, renal cystic disease, and benign adrenal lesions. None of the participants had comorbidities known to cause sexual dysfunction. Based on the type of anesthesia administered during their circumcision, participants were categorized into two groups: Group 1 included individuals who had undergone circumcision under general anesthesia, and Group 2 comprised those who had received local anesthesia. Sociodemographic characteristics, including age, marital status, and educational level, were recorded for each participant. In addition, anthropometric data comprising height, weight, and body mass index (BMI) were calculated. Clinical variables included age at circumcision, indication for the procedure, and any post-operative complications were also analyzed.

Psychological and sexual function assessments were conducted using three validated tools: the Beck Depression Inventory (BDI), the Male Genital Self-Image Scale (MGSIS-7), and the International Index of Erectile Function (IIEF-15) [7-10]. All circumcision procedures had been performed by an experienced urologist using the dorsal slit technique. In the local anesthesia group, bupivacaine was administered via subcutaneous peripheral infiltration at the base of the penis. In the general anesthesia group, anesthesia was induced using a laryngeal mask airway. Standard intraoperative monitoring included a 3-lead electrocardiogram, non-invasive blood pressure, and peripheral oxygen saturation. In the penile block group (Group 2), following sterile preparation in the supine position, 0.5 mg/kg 0.5% bupivacaine was administered at the base of the penis using a 21G needle, 15 minutes before surgery. For patients under anesthesia group (Group 1), 0.05 mg/kg midazolam, 2 mg/kg propofol, and 0.1 mcg/kg fentanyl citrate were administered intravenously according to the standard anesthesia protocol. After achieving the desired depth of anesthesia, a laryngeal mask airway was inserted, and mechanical ventilation was applied.

All data were obtained from the hospital's electronic medical records and the anesthesia and reanimation department's patient follow-up forms. All circumcisions were performed by the same surgeon, and the anesthesia procedures were standardized across all cases. None of the patients had any medical conditions necessitating a change in the anesthesia method. Therefore, the choice of anesthesia was primarily determined by the parents of circumcised boys. To ensure data reliability, any cases involving different surgeons or anesthesia protocols were identified through the hospital's electronic archive and were excluded from the study.

All patients underwent a detailed genital system examination by medical staff. None of the participants presented with unsightly circumcision scars or major cosmetic defects. Following this assessment, the MGSIS-7, IIEF-15, and BDI scores were evaluated. The MGSIS-7 is a psychometrically validated tool comprising seven items designed to assess how men perceive and feel about their genitalia. Participants respond to each item using a four-point Likert scale, and the total score is derived by summing individual item responses. Higher cumulative scores reflect a more positive genital self-image. The Turkish version of the MGSIS-7 was adopted and validated by Koçak et al [10]. Sexual function was measured using the IIEF-15, a standardized questionnaire consisting of 15 items that evaluate multiple key aspects such as erectile quality, orgasm, sexual interest, satisfaction with intercourse, and overall sexual well-being [8]. Depressive symptoms were measured using the BDI, a 21-item, self-report rating scale that assesses the presence and severity of depression. Each item is rated on a four-point scale ranging from 0 (not at all) to 3 (severe), with higher total scores corresponding to increased levels of depression [7].

Participants were excluded if they had not engaged in regular sexual activity within the past six months or had comorbidities

affecting sexual function, including neuropsychiatric disorders, hyperlipidemia, diabetes mellitus, coronary artery disease, hypertension, chronic kidney disease, or hypogonadism. Subjects with a history of pelvic surgery or medication use known to affect erectile function were also excluded from the analysis.

Statistical Analysis

Data analysis was conducted using MedCalc statistical software (version 20.009; Ostend, Belgium). The Kolmogorov–Smirnov test was used to assess the normality of data distribution. Continuous variables were presented as mean ± standard deviation (SD) or as median (interquartile range, IQR), depending on distribution. For group comparisons, the Independent Samples t-test was used for normally distributed variables, and the Mann–Whitney U test was applied to non-normally distributed data. Categorical variables were summarized using frequencies and percentages and evaluated using the Chi-square (χ^2) test. The Kruskal-Wallis test was used for comparison of more than two groups. Numerical data of the groups were visually displayed using box-whisker graphs, and extreme values were indicated as points. Logistic regression was used to identify age, BMI, MGSIS-7, IIEF-15, and BDI parameters as risk factors for circumcision during the phallic stage, according to the type of anesthesia. Odds ratios (OR) and corresponding 95% confidence intervals (CI) for each parameter are reported. A p-value less than 0.05 was considered statistically significant.

Sample size was determined using G*Power software (v3.1.2). The statistical power of the study, expressed as 1-β (where β represents the probability of a Type II error), was set at 80%. According to Cohen's effect size conventions, and assuming a large effect size (d = 0.7) for comparisons between two independent groups, it was calculated that a minimum of 34 participants per group would be required to achieve 80% power at a significance level α = 0.05.

Results

The mean age of participants was 29.65 ± 4.38 years, with no statistically significant difference observed between the two groups (p> 0.05). The most common indication for circumcision was religious in nature, and the majority of individuals in both groups had a university-level education. There were no significant differences between the groups regarding sociodemographic variables or reasons for urology visits (p> 0.05). No participant experienced a complication classified as Grade 3 or higher according to the Modified Clavien-Dindo classification. The mean age at circumcision was 5 years, and this did not differ significantly between the groups (p> 0.05). In Group 1 (general anesthesia), the mean BMI was 20 kg/m2, and 33 participants (89.2%) were married. These characteristics were also similar to those in Group 2 (p> 0.05) (**Table 1**). When MGSIS-7 scores of circumcised individuals were compared according to the reasons for circumcision, no significant difference was found between the groups (p> 0.05).

Table 1. Comparison of demographic data and scores between groups

Variable		Groups		P-Value
		Group 1 (General anesthesia), N = 37	Group 2 (Local anesthesia), N = 47	
Age of circumcision (years), Median (IQR)		5.0 (5-6)	5.0 (5-6)	0.724
BMI (kg/m^2), Median (IQR)		20.0 (19-20)	20.0(19-21)	0.787
MGSIS-7, Median (IQR)		28.0 (27-28)	22.0 (19-25)	**<0.0001***
IIEF-15, Median (IQR)		28.0 (27-28.3)	28.0 (27-29)	0.347
BDI, Median (IQR)		9 (8-10)	9 (8-10)	0.692
Education status	High school, n (%)	4 (10.8)	5 (10.6)	0.980
	University, n (%)	33 (89.2)	42 (89.4)	
Reason for circumcision	Cultural, n (%)	12 (32.4)	11 (23.4)	0.586
	Religious, n (%)	22 (59.5)	33 (70.2)	
	Social, n (%)	3 (8.1)	3 (6.4)	
Post-circumcision complications	None, n (%)	35 (94.6)	43 (91.5)	0.860
	Minimal bleeding, n (%)	1 (2.7)	2 (4.3)	
	Penile edema, n (%)	1 (2.7)	2 (4.3)	
Marital status	Single, n (%)	4 (10.8)	5 (10.6)	0.980
	Married, n (%)	33 (89.2)	42 (89.4)	

* Significant difference at the 0.05 level according to the Mann-Whitney U test. Medians are presented, and the IQR represents the interquartile range. BMI: body mass index; MGSIS-7: Male Genital Self-Image Scale-7; IIEF-15: International Index of Erectile Function-15; BDI: Beck Depression Inventory

The median IIEF-15 and the BDI scores in Group 1 were 28 and 9, respectively, showing no significant difference compared to Group 2 (p> 0.05) (**Table 1**). However, the median MGSIS-7 score was significantly lower in Group 2 (local anesthesia) compared with Group 1 (general anesthesia) (22 vs. higher in Group 1, p< 0.0001) (**Table 2, Figure 1**). In the logistic regression analysis conducted to determine risk factors for circumcision during the phallic stage according to the type of anesthesia, it was found that as the MGSIS-7 score increased, the likelihood of patients receiving general anesthesia also increased (OR: 3.11, p< 0.0001) (**Table 3**).

Discussion

The phallic stage, as described by Sigmund Freud, represents one of the pivotal stages of psychosexual development in childhood. According to the psychoanalytic theory, children between three and six years of age begin to establish their gender identity and become increasingly aware of sexual and anatomical differences. During this period, attention to one's own genitalia typically reaches its peak [11,12]. For these reasons, there is concern that circumcision performed during the phallic stage may be associated with negative psychological consequences or behavioral disturbances in later life. Consequently, circumcision performed during the phallic stage has long been associated with concerns regarding potential psychological distress, behavioral changes, or the development of castration anxiety [13].

Currently, there is no established consensus regarding the optimal anesthesia method during circumcision performed at this particularly sensitive developmental stage. In the present clinical study, we observed that individuals circumcised under

Table 2. Distribution of MGSIS-7 score questions according to groups

Item	Response option	Groups		P-Value
		G1 (General anesthesia) N = 37 (%)	G2 (Local anesthesia) N = 47 (%)	
Q1 = I feel positively about my genitals.	1- Strongly disagree, n (%)	0 (0.0)	18 (38.3)	**<0.0001***
	2- Disagree, n (%)	0 (0.0)	0 (0.0)	
	3- Agree, n (%)	0 (0.0)	0 (0.0)	
	4- Strongly agree, n (%)	37 (100.0)	29 (61.7)	
Q2 = I am satisfied with the appearance of my genitals.	1- Strongly disagree, n (%)	0 (0.0)	10 (21.3)	**0.016***
	2- Disagree, n (%)	1 (2.7)	2 (4.3)	
	3- Agree, n (%)	1 (2.7)	0 (0.0)	
	4- Strongly agree, n (%)	35 (94.6)	35 (74.5)	
Q3 = I would feel comfortable letting a sexual partner look at my genitals.	1- Strongly disagree, n (%)	0 (0.0)	12 (25.5)	**0.006***
	2- Disagree, n (%)	1 (2.7)	0 (0.0)	
	3- Agree, n (%)	1 (2.7)	2 (4.3)	
	4- Strongly agree, n (%)	35 (94.6)	33 (70.2)	
Q4 = I am satisfied with the size of my genitals.	1- Strongly disagree, n (%)	0 (0.0)	11 (23.4)	**0.006***
	2- Disagree, n (%)	1 (2.7)	2 (4.3)	
	3- Agree, n (%)	2 (5.4)	0 (0.0)	
	4- Strongly agree, n (%)	34 (91.9)	34 (72.3)	
Q5 = I think my genitals work the way they are supposed to work.	1- Strongly disagree, n (%)	0 (0.0)	16 (34.0)	**0.000***
	2- Disagree, n (%)	2 (5.4)	0 (0.0)	
	3- Agree, n (%)	0 (0.0)	0 (0.0)	
	4- Strongly agree, n (%)	35 (94.6)	31 (66.0)	
Q6 = I feel comfortable letting a healthcare provider examine my genitals.	1- Strongly disagree, n (%)	0 (0.0)	14 (29.8)	**0.001***
	2- Disagree, n (%)	1 (2.7)	2 (4.2)	
	3- Agree, n (%)	2 (5.4)	0 (0.0)	
	4- Strongly agree, n (%)	34 (91.9)	31 (66.0)	
Q7 = I am not embarrassed about my genitals.	1- Strongly disagree, n (%)	0 (0.0)	18 (38.3)	**0.000***
	2- Disagree, n (%)	1 (2.7)	3 (6.4)	
	3- Agree, n (%)	0 (0.0)	0 (0.0)	
	4- Strongly agree, n (%)	36 (97.3)	26 (55.3)	

* Significant difference at < 0.05 level according to chi-square test; N [%]: presented; Q: question; MGSIS-7: Male Genital Self-Image Scale-7

local anesthesia during the phallic stage exhibited significantly lower genital self-image scores than those circumcised under general anesthesia. This finding may be attributed to the heightened genital awareness in this developmental period, combined with the child's cognitive ability to perceive and remember the surgical process, which may amplify anxiety and negatively influence later genital self-perception.

Circumcision remains one of the oldest and most common surgical interventions performed in males [14]. Despite its prevalence, the choice between local and general anesthesia remains debated in modern clinical practice [4]. For many children, circumcision represents a major psychological stressor, often related to pain and the perceived threat to genital integrity [14,15]. Proponents of local anesthesia cite advantages such as shorter recovery times and fewer systemic risks, whereas general anesthesia is considered to provide a calmer operative setting and reduced perioperative distress, potentially yielding better psychological outcomes [4,14].

The psychosexual consequences of circumcision and their relationship with anesthesia type remain complex and inconsistently reported. For example, Güzelsoy et al. reported that the circumcision process and the hospital setting itself contribute to elevated stress levels in children, particularly when local anesthesia is used [14]. Conversely, Kozanhan et al found that general anesthesia was associated with higher post-traumatic stress scores in children than local anesthesia [1]. Suleyman et al explored the relationship between adult surgical anxiety and the anesthesia type used during childhood circumcision, and no significant association was found [16]. Similarly, Tokuc et al. argued that circumcision does not contribute to later andrological or psychological problems [17].

Our findings suggest that local anesthesia during the phallic stage may have subtle long-term effects on genital self-image perception, even in the absence of overt psychological or sexual dysfunction. Genital self-image refers to an individual's emotional and psychological perception and awareness of their own genitalia, particularly in relation to sexual function and satisfaction [18]. This perception may be influenced by multiple factors, including circumcision status, BMI, body image satisfaction, mood, and the presence of conditions such as phimosis [19,20]. Genital identity, which plays a critical role in shaping sexual orientation, is largely rooted in one's genital self-perception [21]. A positive genital self-image has been shown to correlate with improved psychological well-being [22]. Despite its importance, research specifically focusing on male genital self-perception remains limited [9,22]. In a study involving 69 patients with phimosis, Czajkowski et al. reported a marked improvement in MGSIS-7 scores following circumcision [22]. Similarly, Sonbahar et al. observed that lower genital self-image scores were moderately associated with increased levels of depression and anxiety [9]. In our study, no significant differences were found between the groups in terms of depression scores or erectile function assessments. However, participants who had undergone circumcision under local anesthesia during the phallic stage reported significantly lower genital self-image scores, even though their overall sexual function and psychological status appeared unaffected. We speculate that this may be attributed to the relatively young age of the study population, the majority of whom were under 30 years old.

Figure 1. MGSIS-7 score of the groups

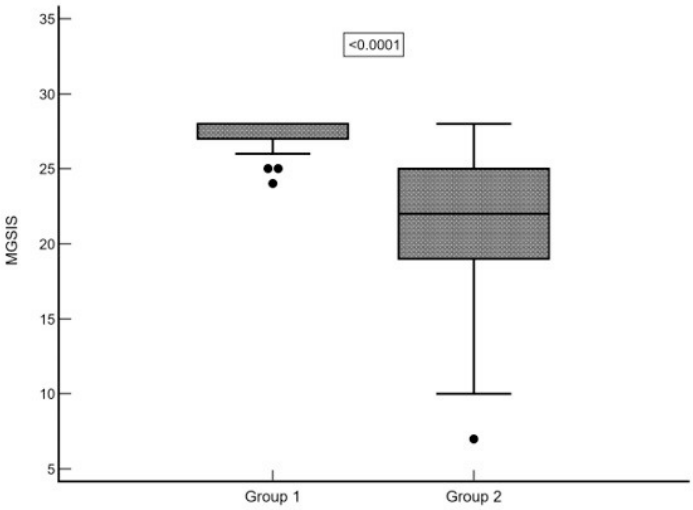

Table 3. Results of logistic regression analyses between the MGSIS-7 score and other variables

Dependet variable= Type of anesthesia	General anesthesia		37
	Local anesthesia		47
Overall model fit	P-Value		**< 0.0001**
	Cox & Snell R^2		0.5685
	Nagelkerke R^2		0.7617
Hosmer & Lemeshow test	P-Value		0.8827
Variables	**OR**	**OR (%95 CI)**	**P**
Age (years)	0.63	(0.17-2.37)	0.494
BMI (kg/m²)	1.45	(0.64-3.31)	0.374
MGSIS-7	3.11	(1.86-5.17)	**<0.0001***
IIEF-15	0.61	(0.26-1.43)	0.255
BDI	0.75	(0.44-1.27)	0.285

Significance at <0.05 level according to regression analyses. MGSIS-7: Male Genital Self-Image Scale; IIEF-15: International Index of Erectile Function; BDI: Beck Depression Inventory; OR: Odds ratio; CI: Confidence interval

The psychosexual consequences of circumcision remain a subject of ongoing debate, with a limited number of studies and no clear consensus in the literature. Yılmaz et al. evaluated the treatment protocols of 149 children with phimosis (mean age of 4.47 years), and found that children who received topical corticosteroid therapy exhibited lower anxiety scores compared with those who underwent circumcision [13]. However, the study did not provide detailed information regarding the anesthesia techniques used during the procedures. In contrast, Armağan et al. conducted a study involving 321 cases and reported that circumcision performed during the phallic stage did not appear to negatively influence psychosexual functioning in adulthood [3]. Notably, nearly all patients (98.4%) in their cohort had undergone the procedure under local anesthesia. Similarly, Yıgman et al. observed no significant differences in sexual function, genital perception, or gender role identification between individuals circumcised during or after the phallic stage [23]. Aydur et al. also found no significant association between the age at circumcision and adult sexual functioning [24]. Our findings are consistent with these observations in terms of erectile function. In our study, which included only individuals circumcised during the phallic stage, sexual function was evaluated using the IIEF-15 questionnaire. The mean IIEF-15 scores in both groups were ≥ 26, indicating the absence of clinically significant erectile dysfunction. In another study, Cüceoğlu et al. examined the relationship between circumcision and sexual dysfunction using the Golombok-Rust Inventory of Sexual Satisfaction (GRISS) in a cohort of 80 participants [25]. Their study showed no significant effect of age at circumcision on subscales such as frequency, communication, satisfaction, avoidance, emotional involvement, or erectile dysfunction. Although the study noted a minor correlation between circumcision during the phallic stage and premature ejaculation, no association with the castration complex was identified. Consistent with these findings, none of the participants in our cohort exhibited clinical signs of premature ejaculation.

Although previous studies have generally reported no direct association between circumcision during the phallic stage and adult sexual dysfunction, it is evident that many of these investigations lacked a comprehensive integration of validated psychological assessments. The phallic stage is characterized by heightened awareness of genital anatomy, making any invasive experience, particularly one performed without anesthesia, potentially traumatic [26]. In a limited case series, Cansever documented that some children perceived circumcision during the phallic stage as an act of aggression or symbolic castration [15]. Similarly, Öztürk examined 50 psychiatric patients presenting with symptoms indicative of castration anxiety, and suggested a potential link between ritual circumcision performed without anesthesia during the phallic-latency phases and the later development of castration-related fears [26]. Consistent with these psychological perspectives, our study found that circumcision performed without general anesthesia during the phallic stage was associated with more negative genital self-image scores in adulthood, suggesting potential long-term psychosexual implications of the anesthesia method used during this sensitive developmental period.

This study has several limitations. The sample size was relatively small, and data were collected from a single institution, which may limit generalizability. However, the study population consisted mainly of well-educated, married young adults with urological follow-up, which limits the generalizability of the findings to a wider population. Genital self-image was evaluated using only one standardized scale, and psychosexual outcomes during childhood were not assessed. Parental perspectives on anesthesia choice could not be obtained due to documentation limitations.

As a cross-sectional design, our study cannot establish causality. Although an association between local anesthesia and more negative genital self-image was identified, a direct cause-and-effect relationship cannot be inferred. Moreover, our findings may have been affected by potential sources of bias and confounding factors. First, recall bias may pose a significant problem because participants' memories of their childhood circumcision experience may have changed over time or been influenced by later life experiences. On the other hand, it is unclear how participants' accurate or conscious memories of their anesthesia experiences are shaped over time. Second, there is the possibility of selection bias; the individuals in our study who could recall their childhood circumcision experiences in detail may not be fully representative of the general population. One of the most critical limitations is the possibility of residual confounding. Although we controlled for known confounders such as age, BMI, education level, and marital status in our analyses, other factors we did not measure may explain this association. For example, parent-child relationship quality, the child's pre-circumcision mood, preoperative counseling, hospital versus ritual environment, and auxiliary health care workers' communication style may have influenced genital self-image. The absence of these variables introduces the possibility of residual confounding and limits the interpretability of the observed association.

Conclusion

This study investigated the impact of the anesthesia method used during circumcision performed in the phallic stage on adult male genital self-image. Our findings indicated that individuals undergoing circumcision under local anesthesia were associated with more negative genital self-perception in adulthood compared to individuals receiving general anesthesia. We hypothesize that this may be related to the heightened genital awareness typical of the phallic stage and the cognitive ability of children under local anesthesia to perceive and process each step of the surgical experience.

Although these findings generate a novel hypothesis regarding the psychological implications of anesthesia choice, prospective, multicenter studies with larger sample sizes and comprehensive psychosexual assessments are needed to confirm the causal mechanisms underlying this association.

Ethics Committee Approval: The study was approved by the Local Ethics Committee of Tokat Gaziosmanpaşa University Faculty of Medicine (Approval No: 25-MOBAEK 241, Date: June 17, 2025).

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Outcomes of Modified Lich–Gregoir Technique in the Management of Iatrogenic Distal Ureteral Injuries

İyatrojenik Distal Üreter Yaralanmalarının Tedavisinde Modifiye Lich–Gregoir Tekniğinin Sonuçları

Süleyman Şahin[1], Metin Savun[1], Çağrı Şevik[1], Yunus Çolakoğlu[2], Ramazan Uğur[1], Halil Lutfi Canat[1]

[1]Department of Urology, Başakşehir Çam Sakura City Hospital, İstanbul, Türkiye
[2]Department of Urology, İstanbul Arel University, İstanbul, Türkiye

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Corresponding Author: Çağrı Şevik / Başakşehir Çam Sakura City Hospital, Department of Urology, İstanbul, Türkiye / cagri.sevik@hotmail.com
ORCID ID: 0000-0003-0288-704X

Abstract

Objective: To evaluate the surgical outcomes of iatrogenic distal ureteral injury repair using the modified Lich–Gregoir ureteroneocystostomy technique, focusing on perioperative parameters, complications, and long-term functional results.
Materials and Methods: In this retrospective analysis, 23 patients who experienced iatrogenic distal ureteral injuries underwent repair using the modified Lich–Gregoir technique from January 2021 to January 2025. The preoperative evaluation included tests such as serum creatinine, urinalysis, renal ultrasound, and cross-sectional imaging, with selective use of retrograde pyelography or renal scintigraphy. Surgical outcomes were measured by examining ureteral patency, renal function, operative details, and complications, which were categorized using the Clavien–Dindo classification. Patient-reported outcomes were assessed through the Patient Global Impression of Change (PGI-C) scale.
Results: The study included 11 men and 12 women, with a median age of 44 years. Gynecological surgery was the leading cause of injury, accounting for 52.2%, followed by urological surgery at 39.1%, and colorectal surgery at 8.7%. The median duration of surgery was 150 minutes, and patients typically stayed in the hospital for 4 days. A psoas hitch procedure was conducted in 3 patients, representing 13.0% of the group. The median follow-up period was 22 months. All patients (100%) experienced successful surgical outcomes. Complications were noted in two patients, with each experiencing a urinary tract infection and a wound infection, both at a rate of 4.3%. Based on PGI-C scores, 95.7% of patients felt "very much improved," while 4.3% reported being "much improved."
Conclusion: The Lich–Gregoir ureteroneocystostomy, when modified, offers a reliable, safe, and effective surgical solution for treating injuries to the distal ureter caused by medical procedures.

Keywords: iatrogenic disease; surgical procedures; ureteral injuries; ureteroneocystostomy

Özet

Amaç: Bu çalışmanın amacı, iyatrojenik distal üreter yaralanmalarının onarımında modifiye Lich–Gregoir üreteroneosistostomi tekniğinin cerrahi sonuçlarını; perioperatif parametreler, komplikasyonlar ve uzun dönem fonksiyonel sonuçlar açısından değerlendirmektir.
Gereçler ve Yöntemler: Bu retrospektif çalışmaya, Ocak 2021 ile Ocak 2025 tarihleri arasında modifiye Lich–Gregoir tekniği kullanılarak iyatrojenik distal üreter yaralanması onarımı yapılan 23 hasta dahil edildi. Preoperatif değerlendirme serum kreatinin düzeyi, idrar tahlili, renal ultrasonografi ve kesitsel görüntüleme yöntemlerini içermekteydi. Retrograd piyelografi veya renal sintigrafi seçilmiş olgularda uygulandı. Cerrahi sonuçlar; üreteral açıklık, renal fonksiyon, operatif özellikler ve Clavien–Dindo sınıflamasına göre komplikasyonlar açısından değerlendirildi. Hasta bildirimli sonuçlar Hasta Küresel Değişim İzlenimi (Patient Global Impression of Change, PGI-C) ölçeği kullanılarak değerlendirildi.
Bulgular: Çalışma grubunu 11 erkek ve 12 kadın hasta oluşturdu; medyan yaş 44 yıl idi. En sık etiyolojik neden jinekolojik cerrahi (%52,2) olup, bunu ürolojik (%39,1) ve kolorektal cerrahiler (%8,7) izledi. Medyan operasyon süresi 150 dakika, medyan hastanede yatış süresi 4 gün olarak saptandı. Üç hastada (%13,0) psoas hitch uygulandı. Medyan takip süresi 22 ay idi. Tüm hastalarda (%100) cerrahi başarı sağlandı. İki hastada (%8,6) minör komplikasyon (bir idrar yolu enfeksiyonu ve bir yara enfeksiyonu) görüldü. PGI-C skorlarına göre hastaların %95,7'si "çok belirgin düzelme", %4,3'ü ise "belirgin düzelme" bildirdi.
Sonuç: Modifiye Lich–Gregoir üreteroneosistostomi, iyatrojenik distal üreter yaralanmalarının tedavisinde güvenli, etkili ve kalıcı bir cerrahi yöntemdir.

Anahtar kelimeler: iyatrojenik hastalık, cerrahi girişimler, üreter yaralanmaları, üreteroneosistostomi

ORCID ID: **S. Şahin** 0000-0002-6043-6354 **Y. Çolakoğlu** 0000-0001-6432-765X **H.L. Canat** 0000-0001-6481-7907
M. Savun 0000-0003-4434-9661 **R. Uğur** 0000-0002-0593-8589

Introduction

Ureteral injuries, although relatively uncommon, represent a serious surgical complication that can result in significant morbidity, including ureteral stricture, hydronephrosis, and loss of renal function if not promptly diagnosed and managed. The vast majority are iatrogenic in nature, with the distal third of the ureter being particularly vulnerable during pelvic procedures such as gynecological, colorectal, and urological surgeries [1–3].

Definitive management of distal ureteral injuries typically requires surgical reconstruction to restore urinary continuity and preserve renal function. Ureteroneocystostomy is the most widely accepted approach, with several techniques described, including the Politano–Leadbetter and the extravesical Lich–Gregoir methods [4]. The Lich–Gregoir technique, originally developed for anti-reflux ureteral reimplantation, has become popular due to its relative technical simplicity, shorter operative time, and low complication profile [5].

Over time, several modifications of the Lich–Gregoir technique have been introduced to optimize outcomes, especially in complex or reoperative settings. The extravesical approach minimizes bladder dissection and avoids extensive intravesical manipulation, which can be advantageous in patients with iatrogenic injuries after major pelvic surgery. However, the evidence specifically addressing the role of the modified Lich–Gregoir technique in adult iatrogenic distal ureteral injuries remains scarce. Most previous reports have either pooled various etiologies or focused primarily on pediatric or reflux populations [6,7].

The objective of this study was to assess the surgical and functional outcomes of repairing iatrogenic injuries to the distal ureter using the modified Lich–Gregoir ureteroneocystostomy technique, with a focus on perioperative factors, complication rates, and long-term functional outcomes.

Material and Methods

After receiving approval from the institutional ethics committee (Date: 06.08.2025; No: 264), a retrospective study was carried out at the Department of Urology, Cam and Sakura City Hospital. The study involved reviewing the medical records of patients who had undergone surgical repair for iatrogenic distal ureteral injuries from January 2021 to January 2025.

Inclusion criteria were: a confirmed iatrogenic injury involving the distal third of the ureter, repair performed using the modified Lich–Gregoir technique. Exclusion criteria included malignant ureteral injuries, bilateral involvement, prior ureteral reconstruction on the affected side, and concomitant bladder pathology requiring alternative reconstruction.

All patients underwent standardized assessment, including physical examination, serum creatinine measurement, and urinalysis. The diagnosis of ureteral injury was established based on clinical suspicion (such as persistent flank pain or fever) and confirmed via CT urography or retrograde pyelography. Imaging studies consisted of renal ultrasonography and either computed tomography urography or magnetic resonance urography to define the extent of injury. Retrograde pyelography was performed in selected cases, while renal scintigraphy was used when functional assessment was clinically indicated. In cases of infection or obstruction, appropriate antibiotics and urinary diversion (ureteral stenting or percutaneous nephrostomy) were applied before definitive surgery.

All procedures were performed via an open surgical approach under general anesthesia by experienced reconstructive urologists. After identification and proximal mobilization of the injured ureter, devitalized tissue was excised and a 4.8 Fr double-J stent was inserted. All patients underwent direct ureteroneocystostomy without the need for additional ureteroureterostomy. The bladder was mobilized toward the ipsilateral psoas tendon when required to reduce tension. The modified Lich–Gregoir ureteroneocystostomy consisted of creating a 2–3 cm submucosal tunnel on the bladder dome or lateral wall. The distal ureter was spatulated for 1–1.5 cm, and a mucosa-to-mucosa anastomosis was fashioned with interrupted 5-0 vicryle sutures. A psoas hitch was applied when necessary to achieve a tension-free anastomosis. A perivesical drain and urethral Foley catheter were placed in all patients, with drains removed once minimal output was achieved. The Foley catheter was removed on postoperative day 14. Double-J stent was removed on postoperative week 6.

The primary outcomes were anastomotic patency and preservation of renal function, assessed by ultrasonography or CT urography at 3, 6, and 12 months postoperatively, and annually thereafter. Secondary outcomes included perioperative parameters (operative time, hospital stay), complications (graded by the Clavien–Dindo system), need for secondary intervention, and patient-reported outcomes. Patient satisfaction was assessed using the Patient Global Impression of Change (PGI-C) scale at the latest follow-up. Postoperative evaluation was based on clinical symptoms and imaging. Routine voiding cystourethrography (VCUG) was not performed; however, it was reserved for patients presenting with symptoms suggestive of vesicoureteral reflux, such as recurrent urinary tract infections or flank pain during voiding. Ureteral patency was confirmed by the absence of hydronephrosis or obstructive uropathy on follow-up imaging.

Statistical Analysis

Data analysis was conducted using IBM SPSS Statistics for Windows, Version 24.0 (IBM Corp., Armonk, NY, USA). To summarize the data, descriptive statistics were applied: continuous variables were presented as median and interquartile range (IQR), while categorical variables were described using frequencies and percentages. The Wilcoxon signed-rank test was employed to assess differences in renal function parameters before and after surgery. A p-value of less than 0.05 was deemed statistically significant.

Results

Among the 23 patients who qualified for the study, there were 11 men and 12 women, with a median age of 44 years (IQR: 35–51). The median body mass index was recorded at 29 kg/m² (IQR: 25–39). Diabetes mellitus was present in 3 patients (13.0%), while hypertension was noted in 4 patients (17.4%). Gynecological surgery was the leading cause of iatrogenic ureteral injury, affecting 12 patients (52.2%), followed by urological procedures in 9 patients (39.1%) and colorectal surgery in 2 patients (8.7%). The right and left ureters were

impacted almost equally, with 12 and 11 cases, respectively (**Table 1**).

In our study group, every injury (100%) was detected after surgery, with a median diagnosis time of 4 days (IQR: 2–7) following the initial operation. The median duration of surgery was 150 minutes (IQR: 110–205), and patients stayed in the hospital for a median of 4 days (IQR: 4–7). A psoas hitch procedure was necessary for 3 patients (13.0%). The median follow-up period was 22 months (IQR: 8–30). All patients (100%) experienced surgical success, which was defined as maintaining renal function and ureteral openness without needing further surgery. Renal function was preserved in all cases. The median serum creatinine level before surgery was 0.92 mg/dL (IQR: 0.78–1.10), and at the last follow-up, it was 0.88 mg/dL (IQR: 0.75–1.05). There was no statistically significant difference between preoperative and postoperative renal function metrics ($p > 0.05$) (**Table 2**).

Postoperative morbidity was low. Two patients experienced Clavien–Dindo grade II complications: one urinary tract infection (4.3%) and one wound infection (4.3%), both managed conservatively. The patient with a urinary tract infection was managed with culture-specific antibiotics and remained infection-free during the subsequent follow-up. No major complications or reoperations occurred during follow-up.

Patient-reported outcomes were highly favorable. According to the PGI-C scale, 22 patients (95.7%) reported being "very much improved," while one patient (4.3%) reported being "much improved."

Table 1. Demographic and preoperative characteristics of patients

Number of patient	23
Gender (Male/Female)	11/12
Age (year)*	44 (35-51)
Body mass index (kg/m^2)*	29 (25-39)
Comorbidities	
Diabetes mellitus	3 (13.0%)
Hypertension	4 (17.4%)
Etiology	
Gynecological surgery	12 (52.2%)
Colorectal surgery	2 (8.7%)
Urological surgery	9 (39.1%)
Side of injury (right/left)	12/11

*: median (interquartile range)

Table 2. Peroperative and postoperative characteristics of patients

Operative time (min)*	150 (110-205)
Length of hospital stay (day)*	4 (4-7)
Use of psoas hitch	3 (13.0%)
Duration of follow-up (months)*	22 (8-30)
Patency	23 (100.0%)
Time to diagnosis (days)	4 (2-7)
Preoperative creatinine (mg/dL)	0.92 (0.78-1.10)
Postoperative creatinine (mg/dL)	0.88 (0.75-1.05)
Complications	
Urinary tract infection	1 (4.3%)
Wound infection	1 (4.3%)
Patient global impression of change score	
Much improved	1 (4.3%)
Very much improved	22 (95.7%)
Re-operation	0

*: median (interquartile range)

Discussion

In this study, we evaluated the surgical outcomes of iatrogenic distal ureteral injury repair using the modified Lich–Gregoir technique. We observed a 100% success rate in terms of ureteral patency and preservation of renal function, with only two minor postoperative complications. These findings confirm that the modified Lich–Gregoir ureteroneocystostomy is a safe and effective reconstructive option in this challenging clinical scenario. The excellent outcomes in our cohort may be attributed to careful patient selection, standardized perioperative management, and the performance of surgery by experienced reconstructive urologists.

In our series, gynecological surgery was the primary etiology (52.2%), which is consistent with the distribution reported by Gild et al. [2] and Selzman et al. [3]. Our findings reinforce that despite advances in surgical techniques, the distal ureter remains highly vulnerable during major pelvic procedures, particularly in cases recognized postoperatively. Such injuries often remain unrecognized intraoperatively, underscoring the importance of early diagnosis and prompt surgical repair to prevent long-term sequelae such as stricture formation, hydronephrosis, and renal function loss.

A variety of surgical techniques have been described for the reconstruction of distal ureteral injuries, including the Politano–Leadbetter and Lich–Gregoir methods. The technical simplicity of the modified Lich–Gregoir technique, as previously noted by Ahn et al. [4] and Atar et al. [5], was reflected in our median operative time of 150 minutes. Furthermore, the complete preservation of renal function—confirmed by stable median creatinine levels (0.92 vs 0.88 mg/dL) supports the safety of this extravesical approach even in the potentially inflammatory environment of an iatrogenic injury. In our series, the use of a modified Lich–Gregoir technique yielded excellent surgical and functional outcomes. Only two minor postoperative complications; urinary tract infection and superficial wound infection were observed, both of which resolved with conservative management. Notably, no patient required reoperation during the follow-up period, and all reconstructions remained patent and functional.

Our results are comparable to those reported in previous studies. Demirdag et al. demonstrated favorable outcomes with the modified Lich–Gregoir ureteroneocystostomy in iatrogenic distal ureteral injuries, with a high success rate and low complication profile [1]. Similarly, laparoscopic adaptations of this technique, sometimes combined with psoas hitch or Boari

flap, have been shown to yield excellent results in benign distal ureteral pathologies [5]. The 100% success rate observed in our study may be attributed to careful patient selection, standardized preoperative evaluation, and performance of surgery by experienced reconstructive urologists.

The present study has several limitations. First, its retrospective design may introduce selection bias. Second, the relatively small sample size limits the generalizability of our findings. While the modified Lich–Gregoir technique is inherently an anti-reflux procedure, a limitation of our study is the lack of routine objective reflux assessment via VCUG. Nevertheless, none of our patients demonstrated clinical symptoms or radiological findings necessitating such invasive testing during the median 22-month follow-up. Third, although our median follow-up duration was 22 months, longer-term outcomes beyond five years are lacking. Finally, the absence of a comparison group prevents direct evaluation of the superiority of this technique over alternative reconstructive methods.

Although there are some limitations, our findings contribute to the increasing evidence that supports the modified Lich–Gregoir ureteroneocystostomy as a reliable, effective, and long-lasting solution for treating iatrogenic distal ureteral injuries. Future prospective research involving larger participant groups and extended follow-up periods is necessary to confirm these results and to compare them with outcomes from other reconstructive methods.

Conclusion

In conclusion, the modified Lich–Gregoir ureteroneocystostomy is a safe, effective, and durable surgical technique for the management of iatrogenic distal ureteral injuries. Our study demonstrates excellent success rates with complete preservation of ureteral patency and stable renal function, alongside high patient satisfaction. This approach offers a reliable and simplified reconstructive option with a low complication profile, particularly for injuries recognized in the postoperative period.

Ethics Committee Approval: This study was approved by the Ethics Committee of Basaksehir Cam and Sakura City Hospital. (Date: 06.08.2025; No: 264).
Informed Consent: Written informed consent was obtained from all patients.
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Conflict of Interest: The authors declare that they have no conflicts of interest.
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A Comparative Analysis of Turkish and English YouTube Videos on Peyronie's Disease in Terms of Content, Quality, and Reliability

YouTube'da Peyronie Hastalığına Yönelik Türkçe ve İngilizce Videoların İçerik, Kalite ve Güvenilirlik Açısından Karşılaştırmalı Analizi

İbrahim Can Aykanat, Buğra Cidani, Muhammed Çakır, Çağdaş Şenel, Şakir Ongun

Department of Urology, Balıkesir University Faculty of Medicine, Balıkesir, Türkiye

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Corresponding Author: İbrahim Can Aykanat / Balıkesir University Faculty of Medicine, Department of Urology, Balıkesir, Türkiye / dricaykanat@gmail.com
ORCID ID: 0000-0001-7144-1522

Abstract

Objective: This study aimed to comparatively evaluate Turkish and English YouTube videos related to Peyronie's disease in terms of content, quality, and reliability.
Materials and Methods: In this observational cross-sectional study, YouTube searches were conducted between January 1 and 15, 2026, using Turkish ("Peyronie hastalığı", "penis eğriliği") and English ("Peyronie's disease", "penile curvature") keywords. After applying inclusion and exclusion criteria, a total of 351 videos (143 Turkish, 208 English) were included. Videos were analyzed according to source of upload, content theme, and engagement metrics. Video quality and reliability were assessed using the JAMA Benchmark Criteria, Modified DISCERN, and Global Quality Score (GQS). Statistical analyses were performed using SPSS version 26.0.
Results: English videos had significantly longer durations and higher view and like counts compared to Turkish videos (all $p<0.001$). English videos also demonstrated significantly higher JAMA, Modified DISCERN, and GQS scores ($p<0.001$). Guideline-discordant or incomplete information was identified in 23.8% (34/143) of Turkish videos and 6.7% (14/208) of English videos, with a statistically significant difference between languages ($\chi^2=19.44$; $p<0.001$). Most videos containing guideline-discordant information were uploaded by private practice or private hospital physicians. In both languages, videos focusing on non-surgical treatments exhibited the lowest quality and reliability scores.
Conclusion: English YouTube videos on Peyronie's disease provide higher-quality and more reliable information compared to Turkish videos. In Turkish content, guideline-discordant information is predominantly concentrated in individually produced and promotional videos. Greater involvement of academic institutions and professional associations in digital health content creation is essential to improve the quality of online patient education.

Keywords: Peyronie's disease, YouTube, social media, health information, video quality

Özet

Amaç: Bu çalışmada, YouTube platformunda Peyronie hastalığına ilişkin Türkçe ve İngilizce videoların içerik, kalite ve güvenilirlik açısından karşılaştırmalı olarak değerlendirilmesi amaçlanmıştır.
Gereçler ve Yöntemler: Bu gözlemsel kesitsel çalışmada, 1–15 Ocak 2026 tarihleri arasında YouTube'da Türkçe ("Peyronie hastalığı", "penis eğriliği") ve İngilizce ("Peyronie's disease", "penile curvature") anahtar kelimeleri kullanılarak yapılan aramalar sonucunda belirlenen videolar analiz edilmiştir. Dahil edilme ve dışlanma kriterleri sonrası toplam 351 video (143 Türkçe, 208 İngilizce) çalışmaya alınmıştır. Videolar; yüklenme kaynağı, içerik teması, izlenme ve etkileşim parametreleri açısından incelenmiş; kalite ve güvenilirlik JAMA Benchmark kriterleri, Modified DISCERN ve Global Quality Score (GQS) kullanılarak değerlendirilmiştir.
Bulgular: İngilizce videoların video süresi, izlenme ve beğeni sayıları Türkçe videolara kıyasla anlamlı derecede daha yüksek bulunmuştur (tümü için $p<0,001$). İngilizce videolar JAMA, Modified DISCERN ve GQS skorları açısından da daha yüksek puanlara sahipti ($p<0,001$). Türkçe videoların %23,8'inde (34/143), İngilizce videoların ise %6,7'sinde (14/208) kılavuz dışı veya eksik bilgi saptanmış olup, fark istatistiksel olarak anlamlıydı ($\chi^2=19,44$; $p<0,001$). Kılavuz dışı bilgi içeren videoların büyük çoğunluğunun özel muayenehane veya özel hastane hekimleri tarafından yüklendiği görüldü. Her iki dilde de cerrahi dışı tedavilere odaklanan videolar en düşük kalite ve güvenilirlik skorlarına sahipti.
Sonuç: YouTube'daki Peyronie hastalığına yönelik İngilizce videolar, Türkçe videolara kıyasla daha yüksek kalite ve güvenilirlik sunmaktadır. Türkçe içeriklerde kılavuz dışı bilginin özellikle bireysel ve tanıtım amaçlı videolarda yoğunlaştığı görülmektedir. Akademik kurumlar ve mesleki derneklerin dijital platformlarda daha aktif rol alması, güvenilir sağlık bilgisinin yaygınlaştırılması açısından önem taşımaktadır.

Anahtar Kelimeler: Peyronie hastalığı, YouTube, sosyal medya, sağlık bilgisi, video kalitesi

ORCID ID: **B. Cidani** 0009-0009-1146-287X **Ç. Şenel** 0000-0002-4030-002X
M. Çakır 0009-0008-1106-8058 **Ş. Ongun** 0000-0002-8253-4086

Introduction

Peyronie's disease is a condition characterized by the formation of fibrotic plaques within the tunica albuginea of the penis, leading to penile curvature, pain, and sexual dysfunction, thereby significantly impairing male quality of life [1]. Although Peyronie's disease can occur across all age groups, it is most commonly encountered in middle-aged men. The reported prevalence of the disease in the literature varies widely, with rates ranging from 0.3% to 20%. Nevertheless, despite differences in study methodologies, the most frequently cited prevalence is approximately 9% [2-4]. It is well recognized that some patients avoid seeking medical care due to embarrassment or reluctance, and even when they do present to healthcare facilities, they often turn to internet-based resources to obtain additional information regarding diagnosis and treatment [5,6].

In recent years, online video-sharing platforms such as YouTube have become easily accessible sources of health-related information for patients. Indeed, in daily urological practice, it is frequently observed that patients actively use YouTube to acquire supplementary information about their medical conditions [7-9]. However, the quality of content available on YouTube is not always adequate, and the largely unregulated nature of the platform may facilitate the dissemination of misleading or inaccurate information.

Although studies evaluating the content quality and reliability of English-language YouTube videos related to Peyronie's disease are available in the literature, there is currently no study focusing on Turkish-language content [10]. Therefore, the aim of the present study was to comparatively evaluate Turkish and English YouTube videos related to Peyronie's disease in terms of content, quality, and reliability.

Materials and Methods

This study was designed as an observational cross-sectional analysis based on the content evaluation of YouTube videos related to Peyronie's disease. For the assessment of Turkish- and English-language videos, an application was submitted to the institutional Health Research Ethics Committee, and it was confirmed that ethical approval was not required for this study.

YouTube searches were conducted between January 1 and January 15, 2026. The keywords "Peyronie hastalığı" and "penis eğriliği" were used for Turkish content, while "Peyronie's disease" and "penile curvature" were used for English content. Searches were performed in a logged-out (non-personalized) mode in both languages, and YouTube's default relevance-based sorting algorithm was applied. For each language, the first 200 videos retrieved from the search results were initially screened for eligibility.

Each video was individually reviewed to determine its suitability for inclusion. The inclusion criteria required that the video be in the relevant language and aim to provide information about Peyronie's disease. Videos unrelated to the disease, off-topic or misleading content (e.g., videos retrieved due to keyword matches but created solely for humorous purposes), duplicate videos, and short-form videos (YouTube "Shorts") with a duration of less than one minute were excluded. In addition, videos without audio or with very poor visual quality were not considered eligible for analysis.

Ultimately, the URLs of the included videos were recorded, and the following data were collected for each video (**Figure 1**).

General characteristics: The upload date, video duration (minutes), number of views, likes, and comments were recorded.

Source of upload: Based on similar studies in the literature and in line with the aims of the present study, the source of upload was classified into five main categories:
(1) Academic institutions or hospitals (universities, training and research hospitals),
(2) Health information websites or urological associations (institutional health platforms and professional societies),
(3) Private practice or private hospital physicians (videos uploaded by individual physicians or private healthcare institutions),
(4) Patients or non-physician individuals (patient experience–based content or non-medical personal channels),
(5) Television programs (health-related programs or media organizations).
For videos produced through collaboration between multiple individuals or institutions, classification was based on the dominant source presenting the primary content of the video.

Content theme: Videos were categorized according to their main thematic focus based on the primary information provided. Accordingly, each video was assigned to one of the following categories:

Figure 1. Flow diagram of the search, screening, and selection process of YouTube videos related to Peyronie's disease

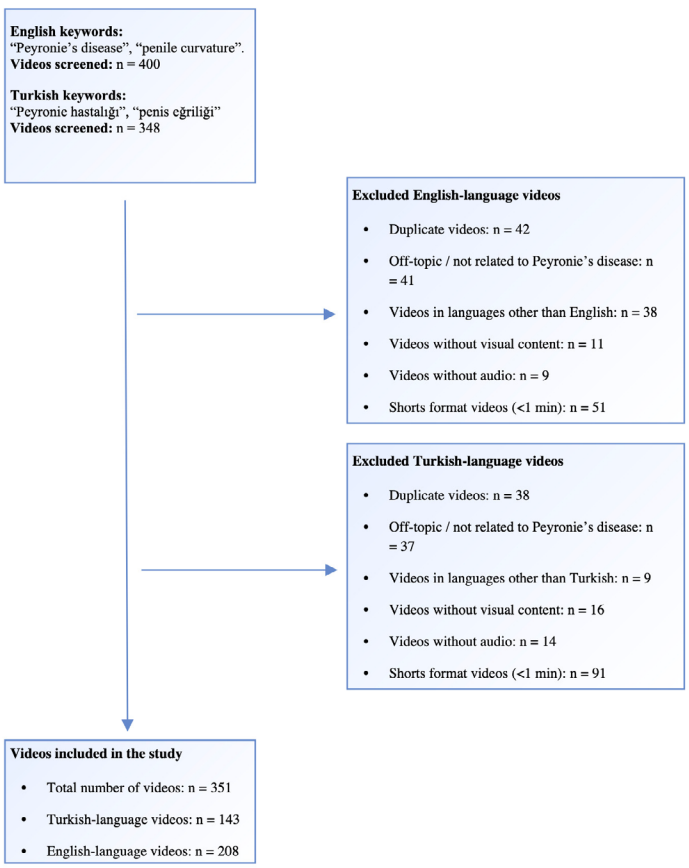


Table 1. Assessment tools used for evaluating the content quality and reliability of YouTube videos

Modified DISCERN (Assessment of the Reliability of Health Information)* [11]			
No	**Assessment Criterion**	**No** (0)	**Yes** (1)
1	Are the aims clear and explicit?	□	□
2	Are reliable sources used?	□	□
3	Is the information balanced and unbiased?	□	□
4	Are additional sources of information provided?	□	□
5	Are areas of uncertainty discussed?	□	□
JAMA Benchmark Criteria (Assessment of transparency and reliability) [12]**			
1	Is authorship / speaker information provided?	□	□
2	Are references cited?	□	□
3	Is the date of publication or upload provided?	□	□
4	Is a conflict of interest or sponsorship disclosure present?	□	□
Global Quality Score (GKS) (Assessment of overall video quality and educational value)* [13]**		**Score**	
Poor quality; very limited information, most content is missing and not useful for patients		1	
Generally poor quality; some information provided but many important topics are missing		2	
Moderate quality; some key information is adequately discussed, others are superficial		3	
Good quality; most information is provided, but some important topics are missing		4	
Excellent quality; very good flow of information, highly useful for patients		5	

*Total score: 0–5; ** Total score: 0–4; *** Total score: 1-5

(1) Anatomy and general information (disease definition, etiology, pathophysiology, and clinical characteristics),
(2) Symptoms and diagnosis (clinical findings and diagnostic approaches),
(3) Non-surgical treatments (pharmacological therapies, intralesional injections, and other conservative approaches),
(4) Surgical procedures (surgical techniques and operative approaches).
When a video addressed more than one topic, classification was performed according to the predominant content theme.

Content accuracy: The scientific accuracy of the medical information presented in the videos was evaluated based on current clinical guidelines and the available literature. Two independent urologists (ÇŞ, İCA) reviewed each video and classified the content as either accurate or inaccurate/misleading according to its consistency with up-to-date evidence. Videos providing evidence-based and guideline-concordant information regarding the management of Peyronie's disease were classified as containing accurate information, whereas videos presenting unproven claims or treatment recommendations not supported by current guidelines were categorized as containing inaccurate or misleading information. In cases of disagreement between the two reviewers, consensus was achieved through an independent evaluation by a third senior urologist (ŞO).

Assessment of video quality and reliability: The quality and comprehensibility of the health-related information provided in the videos were assessed using multiple objective and widely accepted evaluation tools reported in the literature (**Table 1**) [11-13]. Each video was independently scored by two investigators using the following assessment instruments.

All videos were evaluated independently by the two reviewers using the aforementioned scoring systems. When discrepancies occurred between the reviewers, the video in question was re-evaluated by a third expert, and consensus was reached.

Statistical Analysis

All statistical analyses were performed using SPSS software version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were reported as mean ± standard deviation or median with interquartile range (IQR), depending on data distribution, while categorical variables were presented as frequencies and percentages (%). Normality of continuous variables was assessed using the Kolmogorov–Smirnov test.

Comparisons between Turkish and English videos were conducted using the Student's t-test for normally distributed continuous variables and the Mann–Whitney U test for non-normally distributed variables. Categorical variables were compared using the chi-square test, or Fisher's exact test when expected cell counts were insufficient. A p value < 0.05 was considered statistically significant for all analyses.

Results

A total of 351 YouTube videos were included in the analysis, of which 143 (40.7%) were in Turkish and 208 (59.3%) were in English. Comparisons between Turkish and English videos revealed that English videos had significantly longer durations, higher numbers of views, and more likes than Turkish videos (all $p < 0.001$). In contrast, the number of comments was significantly higher in Turkish videos ($p = 0.002$) (**Table 2**).

Regarding content quality and reliability, English videos achieved significantly higher scores than Turkish videos across all assessment tools, including the JAMA Benchmark Criteria, Modified DISCERN score, and Global Quality Score (GQS)

Tablo 2. Comparison of content characteristics, quality, and reliability scores of Turkish and English YouTube videos on Peyronie's disease

Parameters	Turkish (n=143)	English (n=208)	P
Video duration (sn)	143.0 (91.0–237.0)	296.5 (167.0–461.0)	**<0.001**
Number of views	5114.0 (1 028.5–15 103.0)	25223.5 (3 868.0–55 162.2)	**<0.001**
Number of likes	23.0 (4.5–62.0)	47.5 (12.0–195.5)	**<0.001**
Number of comments	3.0 (1.0–11.0)	1.5 (0.0–5.2)	**0.002**
JAMA score	1.0 (1.0–1.0)	4.0 (3.0–4.0)	**<0.001**
Modified DISCERN score	3.0 (1.0–3.0)	4.0 (4.0–4.0)	**<0.001**
GQS score	3.0 (2.0–3.0)	4.0 (4.0–4.0)	**<0.001**
Guideline-discordant information, n (%)	34 (%23.8)	14 (%6.7)	**<0.001**

(all $p < 0.001$). When guideline adherence was evaluated, guideline-discordant or incomplete information was identified in 34 Turkish videos (23.8%), compared with 14 English videos (6.7%). The difference in the prevalence of guideline-discordant content between Turkish and English videos was statistically significant ($\chi^2 = 19.44$; $p < 0.001$) (**Table 2**).

All Turkish videos containing guideline-discordant information (34/34, 100%) were uploaded by physicians working in private practices or private hospitals. In contrast, among the 14 English videos with guideline-discordant or incomplete information, 8 (57.1%) were uploaded by private practice or private hospital physicians, 4 (28.6%) by patients or non-physician individuals, and 2 (14.3%) by health information websites or non-profit organizations.

Most Turkish videos were uploaded by physicians from private practices or private hospitals and primarily consisted of promotional content. Conversely, the distribution of upload sources among English videos was more heterogeneous, with a higher proportion originating from academic institutions and health information websites/urological associations (**Figure 2**). A statistically significant difference was observed between Turkish and English videos in terms of upload source distribution ($\chi^2 = 99.05$; $p < 0.001$).

When video content types were analyzed, videos in both language groups predominantly focused on anatomy and general information. However, a statistically significant difference in content distribution was observed between Turkish and English videos ($\chi^2 = 25.03$; $p < 0.001$) (**Figure 3**).

When analyses were stratified by upload source and language, English videos were found to have higher mean numbers of views and likes than Turkish videos across all source categories. In particular, English videos uploaded by academic institutions, health information websites, and urological associations demonstrated markedly higher levels of viewership and user engagement. In contrast, Turkish videos generally exhibited lower viewing and interaction rates, with the relatively highest numbers of views and likes observed in content originating from television programs (**Figure 4**).

Evaluation of quality and reliability scores according to upload source revealed substantial differences in JAMA, Modified DISCERN, and GQS scores across source types and languages (**Figure 5**). In English videos, content produced by health information websites, urological associations, and academic institutions achieved higher quality and reliability scores, whereas videos uploaded by physicians from private

Figure 2. Distribution of sources of upload for Turkish and English YouTube videos related to Peyronie's disease

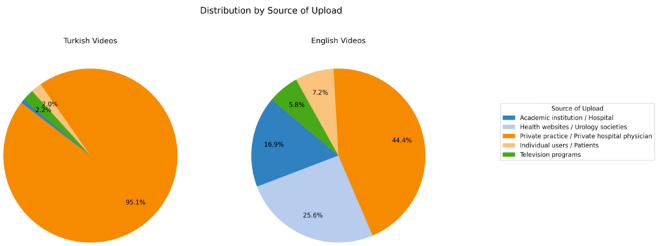


Figure 3. Distribution of Turkish- and English-language YouTube videos on Peyronie's disease according to content categories

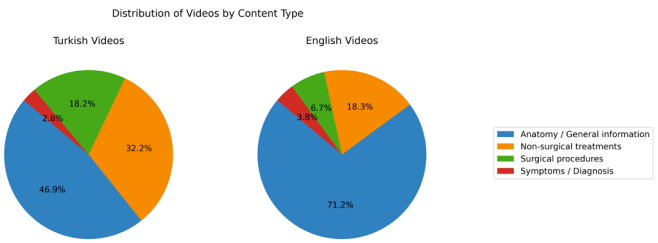


Figure 4. Comparison of the mean number of views and likes of YouTube videos on Peyronie's disease according to upload source and language

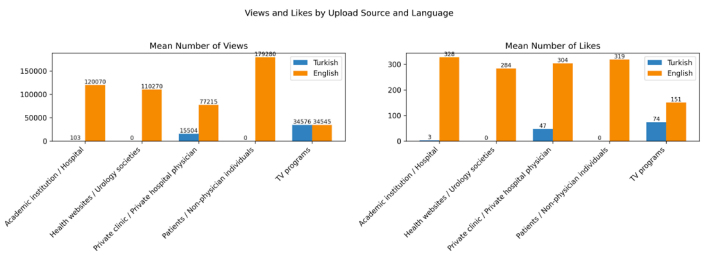
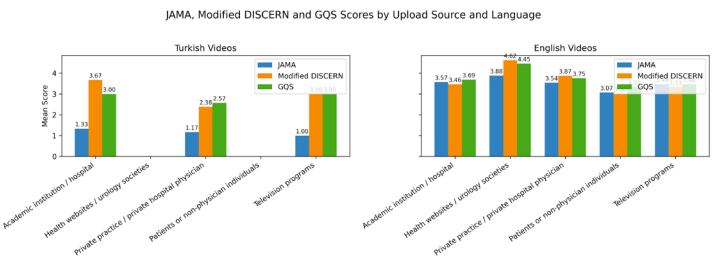


Figure 5. Comparison of JAMA, Modified DISCERN, and GQS scores of YouTube videos on Peyronie's disease according to source of upload and language



practices or private hospitals demonstrated lower scores in both language groups.

In analyses based on video content type, English videos consistently showed higher mean numbers of views and likes than Turkish videos across all content categories (**Figure 6**). Among English-language videos, the highest view counts were observed in content focusing on symptoms and diagnosis, while in Turkish videos, relatively higher view counts were noted in videos addressing non-surgical treatment options. In both language groups, videos focusing on non-surgical treatments received the highest numbers of likes.

When quality and reliability scores were evaluated according to content type, English videos achieved higher JAMA, Modified DISCERN, and GQS scores than Turkish videos across all categories (**Figure 7**). Nevertheless, in both language groups, videos focusing on non-surgical treatments exhibited lower JAMA, Modified DISCERN, and GQS scores compared with other content types.

Figure 6. Comparison of the mean view and like counts of YouTube videos according to video content and language

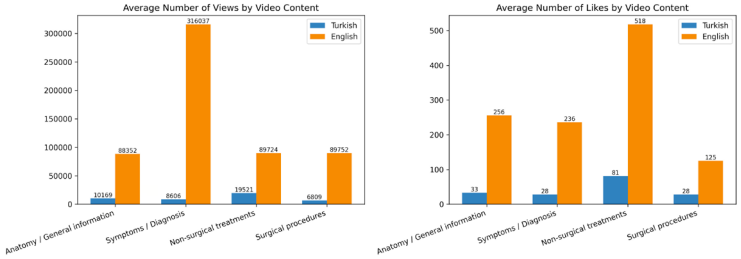
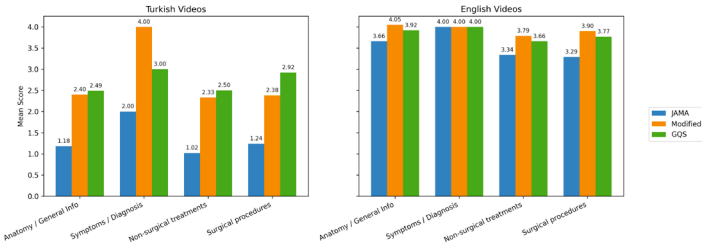


Figure 7. Comparison of JAMA, Modified DISCERN, and GQS scores of YouTube videos according to video content and language



Discussion

This study provides a comprehensive comparative analysis of Turkish and English YouTube videos related to Peyronie's disease in terms of content, quality, and reliability. Our findings demonstrate that, beyond language differences, both the source of upload and the primary focus of video content play a decisive role in determining information quality and adherence to clinical guidelines. In our analysis, English-language videos were found to have longer durations and significantly higher numbers of views and likes compared with Turkish videos. The broader global use of the English language may partly explain these differences. Supporting this assumption, previous studies comparing English and Turkish YouTube content have similarly reported longer video durations and higher engagement metrics for English-language videos [14].

In the present study, Turkish videos exhibited significantly lower JAMA, Modified DISCERN, and GQS scores than English videos, along with a higher prevalence of guideline-discordant information. One plausible explanation for this finding is that Turkish videos predominantly consisted of promotional content uploaded by physicians working in private practices or private hospitals, while videos produced by academic institutions or hospitals were relatively scarce. Prior studies have shown that videos uploaded by academic institutions, urological associations, and health information websites rarely contain guideline-discordant information and generally provide more balanced, evidence-based content, reflected by higher JAMA, Modified DISCERN, and GQS scores [15,16]. Consistent with these findings, Aydın et al. reported that YouTube videos on chronic prostatitis uploaded by individual physicians frequently lacked sufficient scientific accuracy [17].

Similarly, Baydilli et al., in their analysis of English-language YouTube videos on Peyronie's disease, reported that a substantial proportion of videos were of low to moderate quality and provided limited guideline-concordant treatment information, particularly among content produced by individual creators and commercially motivated sources. In that study, treatment-focused and highly popular videos more frequently contained inaccurate or incomplete information—often emphasizing herbal products or experimental approaches—with nearly half of such videos (48.3%) being inconsistent with current clinical guidelines. Moreover, videos containing misinformation were shown to receive higher daily view and like counts compared with those providing accurate information [10].

High view or like counts, however, should not be interpreted as indicators of accuracy, balance, or reliability. Indeed, studies evaluating YouTube content across various medical topics have consistently demonstrated that videos with lower information quality may achieve higher view counts and broader dissemination, thereby facilitating the spread of inaccurate or incomplete health information [18,19]. In line with these observations, our study found that videos focusing on non-surgical treatment options—particularly in both Turkish and English content—were characterized by higher user engagement alongside lower JAMA, Modified DISCERN, and GQS scores, as well as a higher frequency of guideline-discordant information. This finding highlights a clear mismatch between popularity and scientific quality. These results suggest that engagement-driven algorithms on social media platforms may prioritize attention-grabbing narratives and "easy solution" messages over scientific accuracy. Importantly, this issue does not appear to be specific to Peyronie's disease but rather reflects a broader challenge inherent to digital health content dissemination [18,20].

From a public health perspective, patients with conditions associated with sexual health and potential stigma, such as Peyronie's disease, are particularly likely to seek information through digital platforms. Our findings indicate that Turkish-speaking patients are disproportionately exposed to individual, often promotional, video content. Such exposure may contribute to unrealistic expectations, delays in seeking effective treatment, and deterioration of the patient–physician relationship. Therefore, greater involvement of urological associations and academic institutions in producing high-quality Turkish-

language digital content is essential, along with a more proactive role in guiding digital health communication.

Several limitations of this study should be acknowledged. First, YouTube search results are inherently dynamic; thus, the analyzed videos represent a specific time frame, and results may change over time. Second, the study was limited to Turkish and English videos, excluding content in other languages. Third, although widely used and validated tools such as the JAMA benchmark criteria, Modified DISCERN, and Global Quality Score were employed, some degree of subjectivity in quality assessment is unavoidable. Nevertheless, this limitation was mitigated by independent evaluations conducted by two reviewers, with consensus achieved through a third evaluator when necessary. Finally, engagement metrics such as views and likes reflect popularity rather than scientific accuracy and should not be interpreted as indicators of information quality.

Conclusion

This study demonstrates substantial differences between Turkish and English YouTube videos related to Peyronie's disease in terms of content, quality, and reliability. English-language videos generally achieved higher JAMA, Modified DISCERN, and Global Quality Score values, whereas Turkish videos more frequently contained guideline-discordant or incomplete information, particularly within specific source and content categories. Videos focusing on non-surgical treatment options were associated with lower quality and reliability scores in both languages. Notably, all Turkish videos containing guideline-discordant information were uploaded by physicians working in private practices or private hospitals, highlighting the need for critical appraisal of physician-generated digital content. These findings underscore the importance of more active involvement by academic institutions and professional societies in producing reliable, evidence-based health information on digital platforms.

Ethics Committee Approval: For the assessment of Turkish- and English-language videos, an application was submitted to the institutional Health Research Ethics Committee, and it was confirmed that ethical approval was not required for this study. Accordingly, ethical approval was waived in accordance with institutional and international research guidelines.
Informed Consent: This observational study evaluated publicly available YouTube videos and did not involve human participants or confidential data.
Publication: The results of the study were not published in full or in part in form of abstracts.
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Case Report - Endourology
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Endoscopic Treatment of a Giant Prolapsed Ureterocele: A Case Report and Review of the Literature

Dev Prolabe Üreteroselin Endoskopik Tedavisi: Bir Olgu Sunumu ve Literatür Taraması

Gaëtan Devos, Xander De Troyer, Carl Van Haute

Department of Urology, University Hospitals Leuven, Leuven, Belgium

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Corresponding Author: Gaëtan Devos / University Hospitals Leuven, Department of Urology, Leuven, Belgium / gaetan.devos@uzleuven.be
ORCID ID: 0000-0002-6772-915X

Abstract

Ureteroceles are congenital cystic dilatations of the distal ureter, usually diagnosed in childhood. Symptomatic cases in adults are rare, and giant intravesical ureteroceles with intermittent urethral prolapse are exceptionally uncommon. Optimal management in adults is debated, particularly in balancing symptom relief against the risk of postoperative vesicoureteral reflux.

A 48-year-old woman presented with a giant (6.8 cm) right-sided orthotopic intravesical ureterocele causing intermittent urethral prolapse and obstructive lower urinary tract symptoms. Because renal function was preserved and complaints were limited, conservative management was initially chosen. Progression to significant functional impairment led to endoscopic transurethral resection (deroofing). Recovery was uncomplicated, with complete symptom resolution and no hydronephrosis or signs suggestive of reflux on follow-up imaging.

Endoscopic treatment of a giant prolapsed intravesical ureterocele in adults can be safe and effective after careful selection and requires long-term follow-up to monitor for reflux.

Keywords: ureterocele, prolapse, endoscopic treatment

Özet

Üreteroseller, genellikle çocukluk çağında teşhis edilen, distal üreterin konjenital kistik dilatasyonlarıdır. Erişkinlerde semptomatik vakalar nadirdir; aralıklı üretral prolapsusun eşlik ettiği dev intravezikal üreteroseller ise son derece sıra dışıdır. Erişkinlerde optimal yönetim, özellikle semptomların giderilmesi ile ameliyat sonrası vezikoüreteral reflü riski arasındaki dengenin kurulması açısından tartışmalıdır.

48 yaşında bir kadın hasta, aralıklı üretral prolapsusa ve obstrüktif alt üriner sistem semptomlarına neden olan, sağ taraflı dev (6,8 cm) bir ortotopik intravezikal üreterosel ile başvurmuştur. Böbrek fonksiyonları korunduğu ve şikayetler sınırlı olduğu için başlangıçta konservatif yönetim tercih edilmiştir. Ancak fonksiyonel bozukluğun belirginleşmesi üzerine endoskopik transüretral rezeksiyon (deroofing) uygulanmıştır. İyileşme süreci sorunsuz geçmiş; semptomlar tamamen düzelmiş ve takip görüntülemelerinde hidronefroz veya reflü şüphesi uyandıran herhangi bir bulguya rastlanmamıştır.

Erişkinlerde dev, prolabe intravezikal üreterosellerin endoskopik tedavisi, dikkatli bir seçimden sonra güvenli ve etkili olabilir; ancak reflü takibi için uzun süreli izlem gerektirir.

Anahtar kelimeler: üreterosel, prolapsus, endoskopik tedavi

ORCID ID: **X. De Troyer** 0009-0005-8266-1017 **C. Van Haute** 0009-0002-1514-0877

Introduction

Ureteroceles are defined as cystic dilatations of the terminal ureter within the bladder and result from a congenital defect in ureteral embryogenesis [1]. They are classically diagnosed in pediatric populations, often associated with duplicated collecting systems and extravesical localisation (ectopic in the bladder neck or urethra). In contrast, adult ureteroceles are rare, typically intravesical (or orthotopic), and frequently discovered incidentally [2,3].

Clinical presentation in adults ranges from asymptomatic findings to recurrent urinary tract infections, urolithiasis, hematuria, or obstruction. Prolapse of a ureterocele through the urethra has been described only sporadically in the literature [4].

Management strategies include observation, endoscopic incision or resection, and open or minimally invasive ureteral reimplantation [2]. However, due to the rarity of this condition in adults, no consensus guidelines exist. We present a rare case of a giant prolapsed ureterocele in an adult woman treated successfully with endoscopic deroofing, and we review the relevant literature.

Case

A 48-year-old woman was referred to the urology clinic in December 2020 for evaluation of a suspected cystic lesion at the level of the bladder or distal ureter. Her medical history was notable for prior knee surgery and one vaginal delivery. She reported a 10-day history of intermittent right flank pain, radiating to the groin and suprapubic region, accompanied by dysuria. There was no macroscopic hematuria, fever, or chills. She reported occasional cystitis episodes in the past (1-2 per year).

Laboratory investigations showed preserved renal function (serum creatinine 0.74 mg/dL, estimated glomerular filtration rate 97 mL/min/1.73 m²) and an elevated C-reactive protein level of 35 mg/L without leukocytosis. Urine analysis revealed pyuria, but urine culture was negative. Urine cytology analysis was negative.

Cystoscopy demonstrated a large right-sided ureterocele with a normal left ureteric orifice and no intravesical lesions suspicious for malignancy. Renal and bladder ultrasonography showed a large right intravesical ureterocele associated with mild to moderate right-sided hydronephrosis. Uroflowmetry revealed a reduced maximum flow rate (Qmax 9 mL/s) with negligible postvoid residual.

Computed tomography intravenous urography confirmed a solitary collecting system with a 6.8 cm orthotopic intravesical ureterocele on the right, associated with moderate hydronephrosis (**Figure 1**). A 99mTc-ethylenedicysteine renal scan demonstrated near-symmetric renal function (right 43%, left 57%) and no scintigraphic evidence of obstruction.

Given the absence of significant symptoms and preserved renal function, a conservative approach was initially adopted with regular follow-up. However, in November 2021, the patient presented to the emergency department with intermittent vaginal swelling and episodes of obstructive voiding. Clinical history and photographic documentation suggested episodic prolapse of the ureterocele through the urethra, which reduced spontaneously with rest (**Figure 2**). Despite progression of functional complaints over the following year, renal function remained stable, and imaging showed no worsening of upper tract dilatation.

Figure 2. Prolapsed mass from the urethral opening

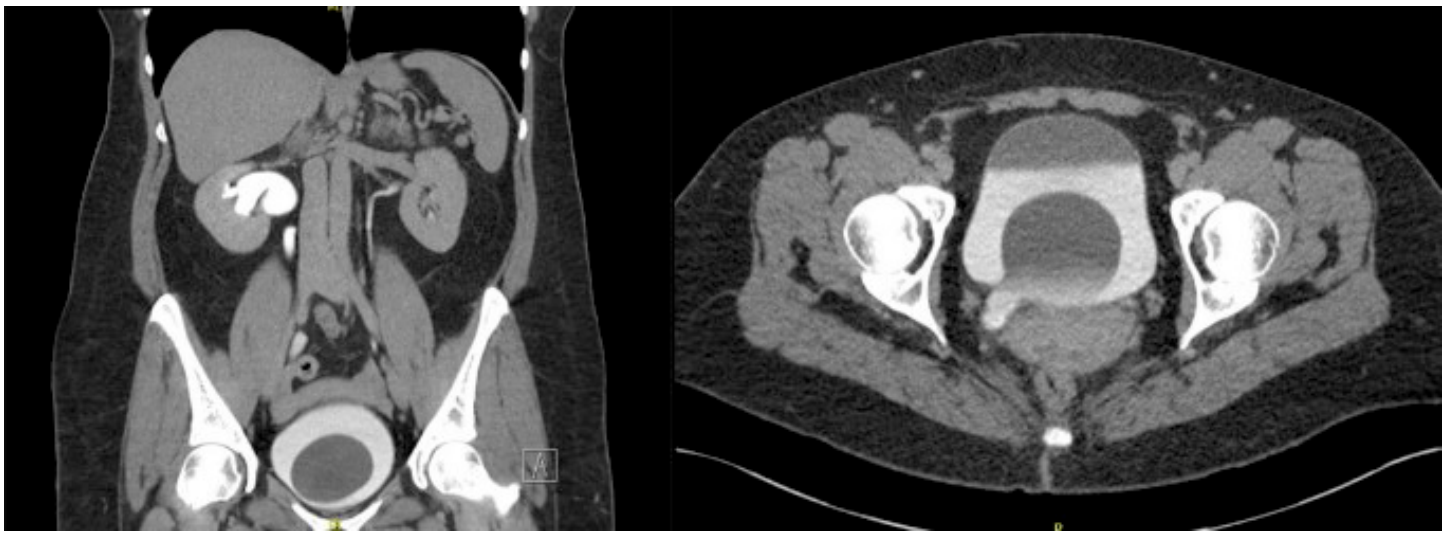

Figure 1. CT urography demonstrating a giant intravesical ureterocele

By late 2022, the patient experienced increasing obstructive micturition significantly interfering with daily activities, particularly due to her standing occupation in the hospitality sector. After multidisciplinary discussion and detailed counseling regarding the risk of postoperative vesicoureteral reflux, a decision was made to proceed with endoscopic treatment.

In February 2023, transurethral endoscopic resection (deroofing) of the ureterocele was performed. Intraoperatively, a giant intravesical ureterocele was visualized and completely resected, revealing a widely patent distal ureter (**Figure 3**). The procedure and postoperative course were uncomplicated. Histopathological examination showed benign urothelial tissue without malignancy.

At follow-up one month postoperatively, the patient reported marked improvement with resolution of obstructive symptoms and only mild urgency. Ultrasonography demonstrated no hydronephrosis and normal bladder emptying. At 6- and 12-month follow-up, she remained asymptomatic with normal renal imaging and stable renal function.

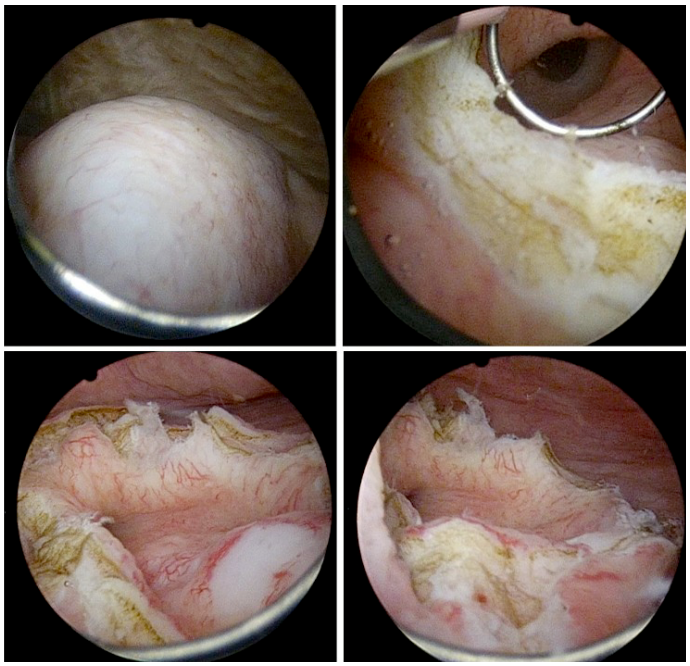

Figure 3. Intraoperative cystoscopic images of endoscopic deroofing

Discussion

Adult ureteroceles are rare entities, accounting for a small minority of all ureteroceles described in the literature. Unlike pediatric cases, adult ureteroceles are typically intravesical, associated with a single collecting system, and less frequently complicated by significant renal dysfunction.

Giant ureteroceles in adults have been reported only in isolated case reports [3-13]. Prolapse of a ureterocele through the urethra is particularly rare and may clinically mimic pelvic organ prolapse or a urethral diverticulum, frequently resulting in diagnostic delay. The diagnostic value of transvaginal voiding sono-urethrography for dynamic visualization of ureterocele prolapse during micturition has been demonstrated and may help distinguish a prolapsed ureterocele from pelvic organ prolapse or a urethral diverticulum. This diagnostic challenge has been highlighted in several reports describing prolapsed ureteroceles that were initially misdiagnosed as urethral cysts. While some patients present with gradual or intermittent symptoms, more acute clinical scenarios have also been described. In particular, several cases report complete acute urinary retention in adult women as a result of ureterocele prolapse [3-8]. In the present case, intermittent prolapse caused functional bladder outlet obstruction, leading to a significant impairment in quality of life.

Management options for adult ureteroceles range from conservative observation to definitive reconstructive surgery. Conservative management may be appropriate in asymptomatic patients with preserved renal function and no evidence of obstruction on computed tomography (CT) urography or nuclear imaging, as demonstrated by the initial course in our patient. However, progression of symptoms over time necessitates reassessment of the treatment strategy.

Endoscopic incision (transverse "smiling" incision) or deroofing is widely regarded as a minimally invasive first-line treatment for intravesical ureteroceles in adults. The principal concern associated with this approach is the potential development of vesicoureteral reflux due to disruption of the ureterovesical junction. Reported reflux rates after endoscopic treatment in adults vary between 0% and 30%, although clinically significant reflux requiring secondary intervention appears to be uncommon, particularly in cases of intravesical ureteroceles [4]. Another reported complication following unroofing of a prolapsed ureterocele is the formation of a large redundant mucosal flap that may function as a flap valve, leading to persistent symptoms and requiring secondary endoscopic trimming to ensure a patent urethral lumen [3-8].

Several published case reports describe successful endoscopic management of prolapsed ureteroceles in adult women, with favourable functional outcomes and low complication rates [4,6]. Consistent with these reports, our patient experienced complete symptom resolution without signs of vesicoureteral reflux or upper urinary tract deterioration on mid-term follow-up.

Definitive ureteral reimplantation remains a valid option in cases of refractory symptoms, recurrent infections, or significant reflux following endoscopic therapy [2]. Overall, a stepwise approach that begins with minimally invasive treatment appears justified in the majority of adult patients.

Conclusion

This case report highlights a rare presentation of a giant prolapsed intravesical ureterocele in an adult woman. Endoscopic transurethral resection provided effective symptom relief with preservation of renal function and no postoperative complications. Careful decision-making and long-term follow-up are essential in managing this uncommon condition.

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Informed Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.
Publication: The results of the study were not published in full or in part in form of abstracts.
Peer-review: Externally peer-reviewed.

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Clinical Image - General Urology
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Scrotal Hydrocele in Immunoglobulin G4-related Disease
İmmünoglobulin G4 ile İlişkili Hastalıkta Skrotal Hidrosel

Ryoya Oka, Atsushi Okita

Department of Surgery, Setouchi City Hospital, Okayama, Japan

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Corresponding Author: Ryoya Oka / Setouchi City Hospital, Department of Surgery, Okayama, Japan
pswt8oxw@s.okayama-u.ac.jp / ORCID ID: 0009-0008-5763-5564

A 78-year-old male patient presented to our hospital with a slowly enlarging, painless right inguinal mass that had been present for 15 years. On physical examination, a non-tender right scrotal mass was palpable. Computed tomography revealed a 12-cm encapsulated cystic lesion containing a calculus (**Figure 1**). Blood tests showed a mildly elevated C-reactive protein (CRP) level of 0.74 mg/dL (reference range: < 0.14 mg/dL). Based on these findings, a diagnosis of right scrotal hydrocele was made, and the patient underwent right orchiectomy with hydrocelectomy. Intraoperative findings indicated that the mass was located in the scrotum and extended toward the external inguinal ring. Orchiectomy was selected because the hydrocele was firmly adherent to the testis, with chronic inflammation and fibrosis, making safe separation technically unfeasible. The resected specimen contained turbid fluid, a calculus, and a markedly thickened, inflamed, and partially necrotic cyst wall (**Figure 2**). Histopathological examination revealed diffuse thickening of the tunica vaginalis with dense lymphoplasmacytic infiltration and characteristic storiform fibrosis (**Figure 3A**). The testis itself was markedly atrophic, and the seminiferous tubules showed diffuse atrophy with thickened basement membranes and hyalinization. The hydrocele was not located within the testicular parenchyma. Immunohistochemical staining demonstrated 27-48 Immunoglobulin G4 (IgG4)-positive plasma cells per high-power field (HPF) and an IgG4-positive/IgG-positive plasma cell ratio of 25-55% (**Figure 3B**). Given the patient's long-standing, slowly enlarging inguinal mass without prior hospital visits, and the marked chronic inflammatory changes observed intraoperatively and pathologically, the exact origin and progression from the inguinal area cannot be determined.

Serum IgG4 was within normal limits, and no involvement of other organs was observed. According to the 2019 American College of Rheumatology/European League Against Rheumatism (ACR/EULAR) classification criteria for IgG4-related disease [1], a diagnosis of IgG4-related disease (IgG4-RD) was established. The postoperative course was uneventful, and the patient remains well on follow-up.

IgG4-RD is a recently recognized, immune-mediated fibroinflammatory disorder characterized by tissue infiltration with IgG4-positive plasma cells, lymphoplasmacytic inflammation, storiform fibrosis, and frequently obliterative phlebitis [2]. It can involve multiple organs, most commonly

Figure 1. Computed tomography image. Computed tomography scan showing a 12-cm encapsulated cystic lesion with a calcified nodule in the right inguinal region

Figure 2. Gross appearance of the resected specimen showing a thickened, inflamed, and focally necrotic cyst wall

ORCID ID: **A. Okita** 0000-0002-3146-5332

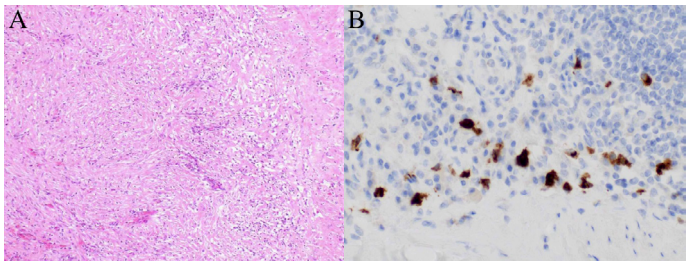

Figure 3. A- Histopathological examination revealing lymphoplasmacytic infiltration and storiform fibrosis (H&E ×100), B- Immunohistochemical stain highlighting numerous IgG4 positive plasma cells (×400)

the pancreas, salivary glands, and lacrimal glands, resulting in clinical entities such as autoimmune pancreatitis, sialadenitis, and dacryoadenitis. Corticosteroid therapy is considered the first-line treatment, although no randomized controlled trials have been conducted to date. In the present case, systemic therapy was not initiated because serum IgG4 was normal and there was no evidence of extra-scrotal disease.

Reports of IgG4-RD involving the male reproductive system are rare, with only a few testicular cases described in the literature. To our knowledge, presentation as chronic scrotal hydrocele represents an exceptionally uncommon manifestation. This case underscores the importance of considering IgG4-RD in the differential diagnosis of long-standing scrotal masses, particularly when histological features are suggestive. Increased awareness of this entity may facilitate accurate diagnosis, appropriate management, and a deeper understanding of its diverse clinical spectrum.

Keywords: immunoglobulin G4-related disease, scrotal hydrocele, storiform fibrosis

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